

# THE IRON AGE

A Review of the Hardware, Iron and Metal

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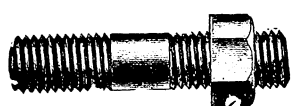
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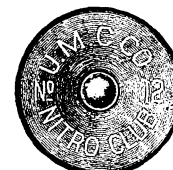
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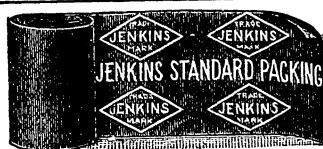
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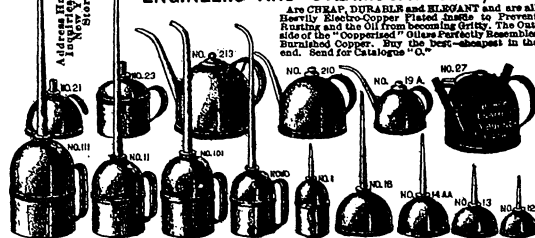
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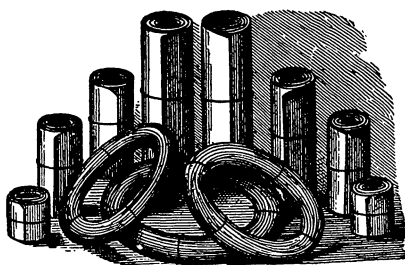
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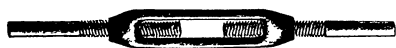
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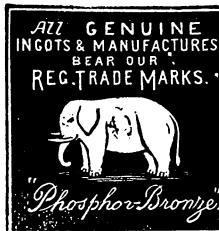
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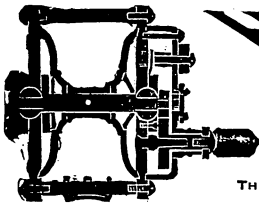
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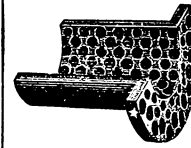
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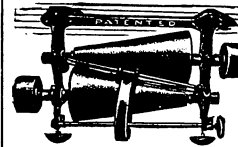
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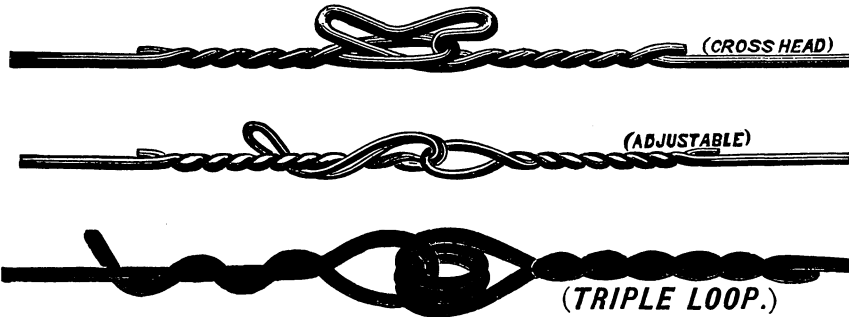
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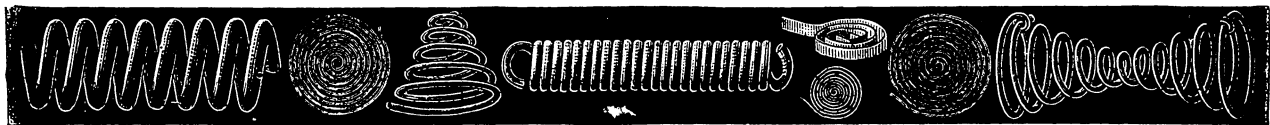
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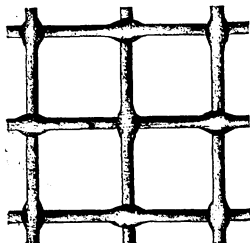
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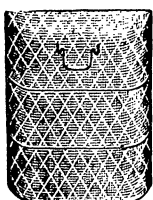
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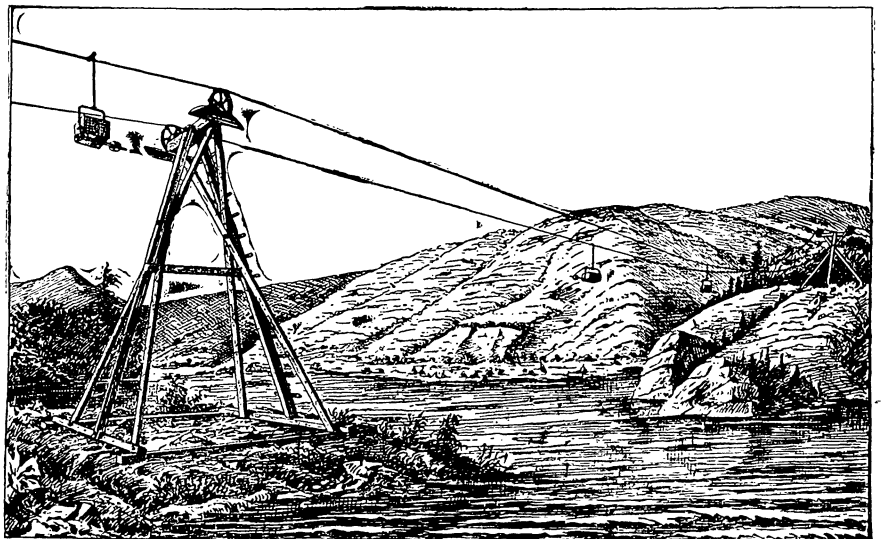
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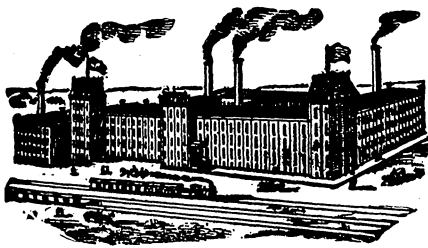
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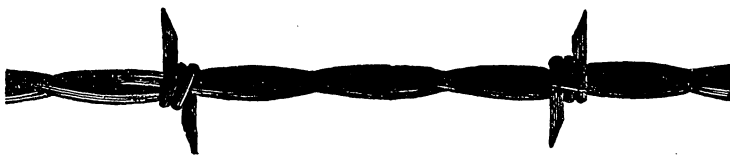
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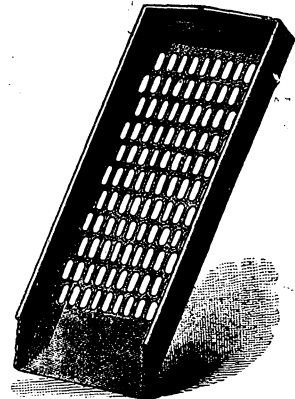
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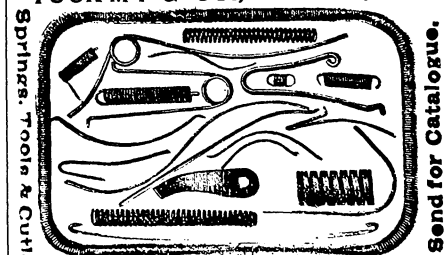
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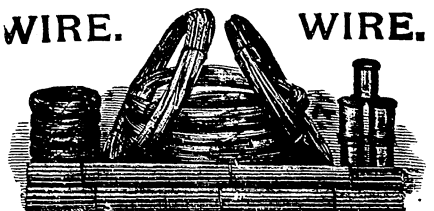
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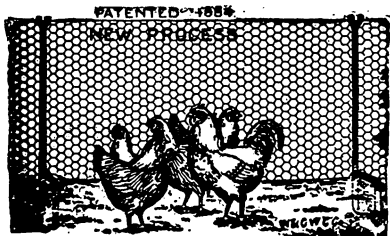
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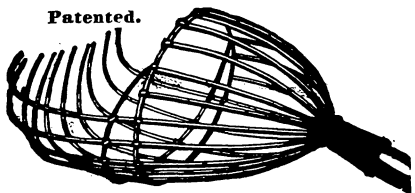
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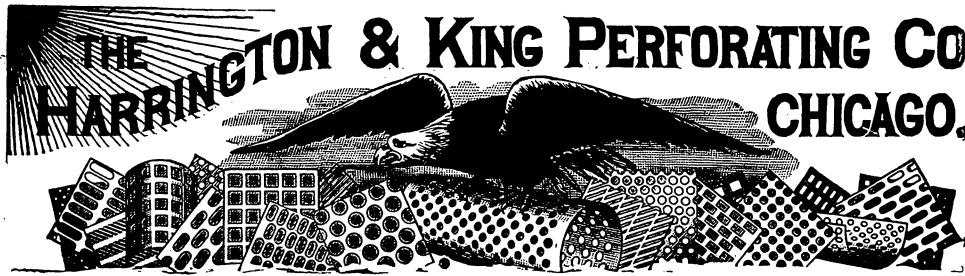
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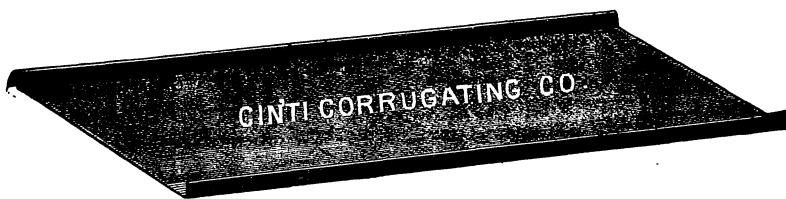
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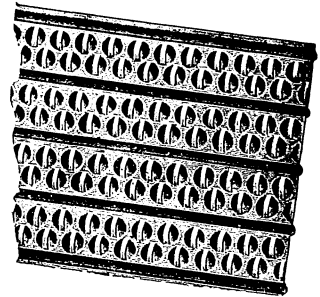


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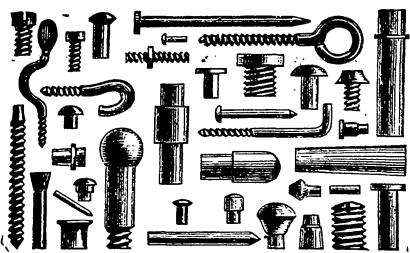
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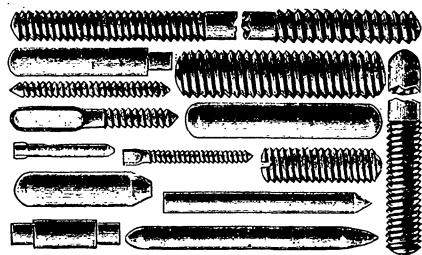
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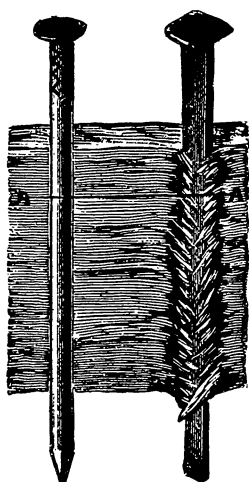
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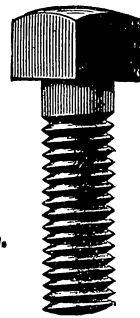
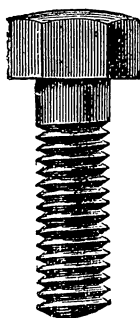
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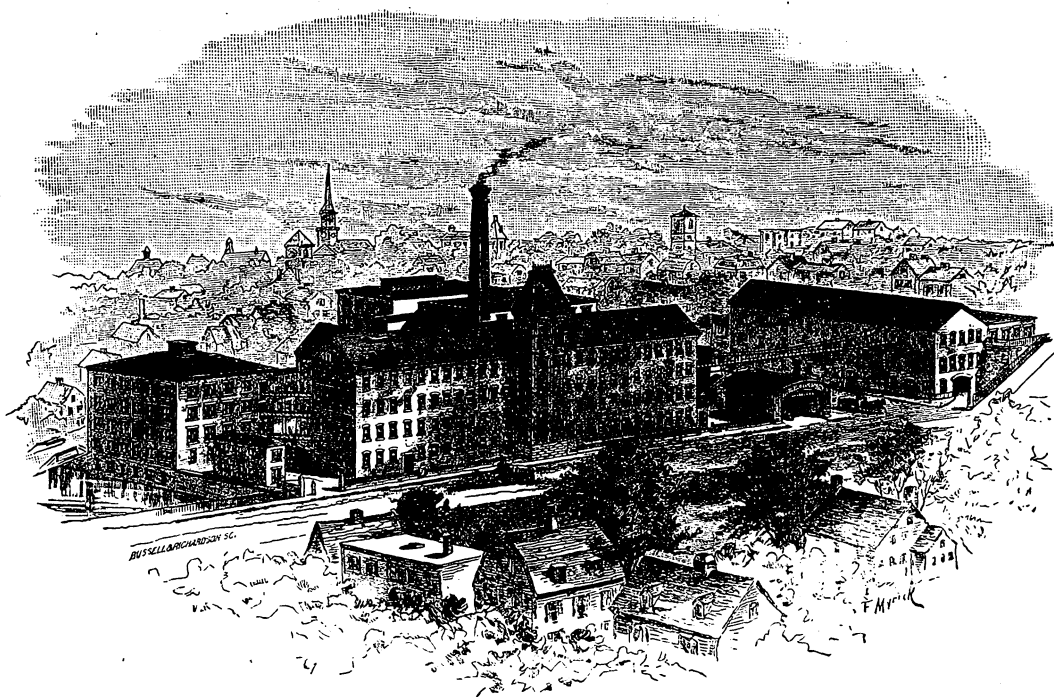
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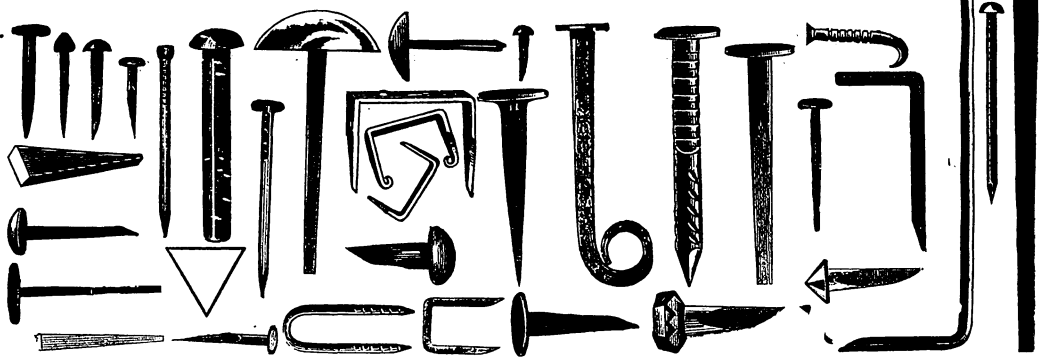
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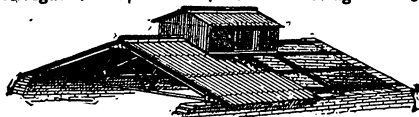


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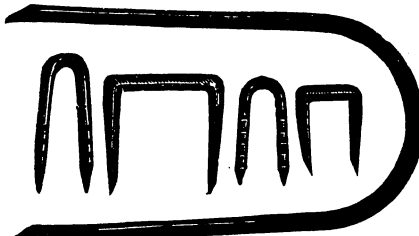


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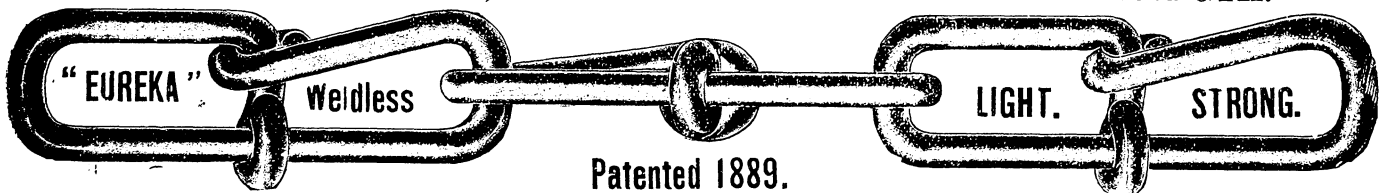
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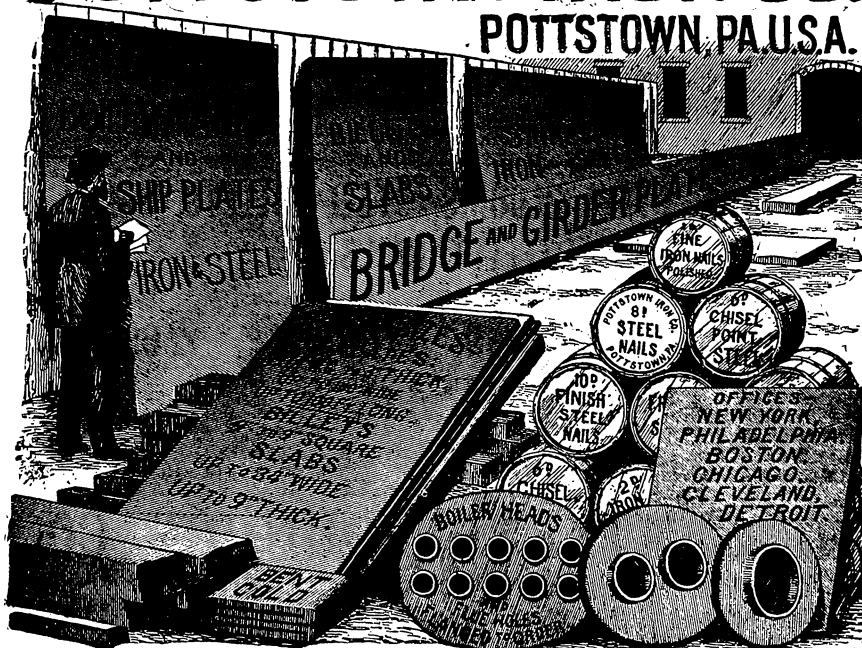
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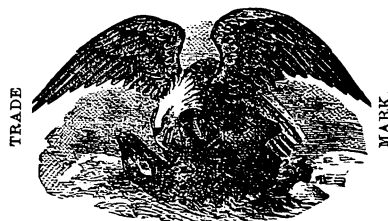
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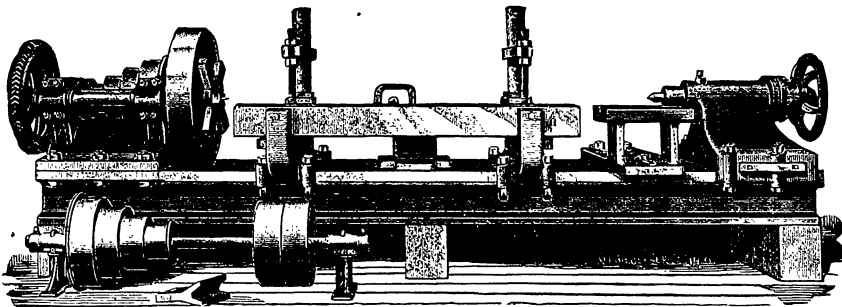
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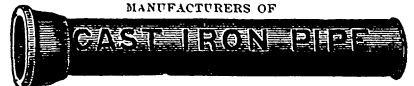
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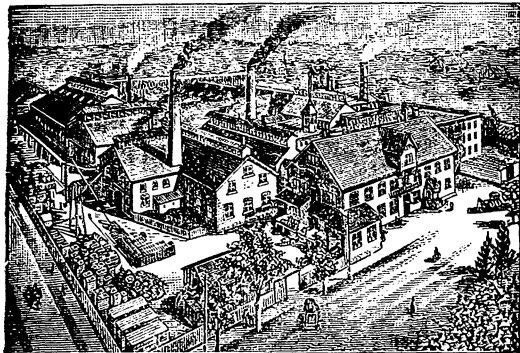
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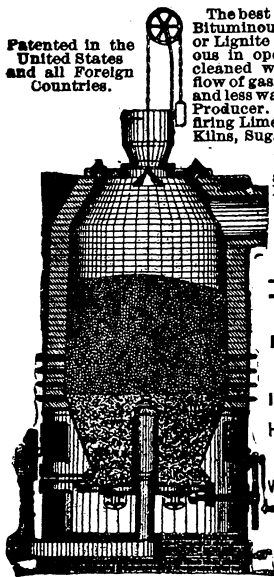
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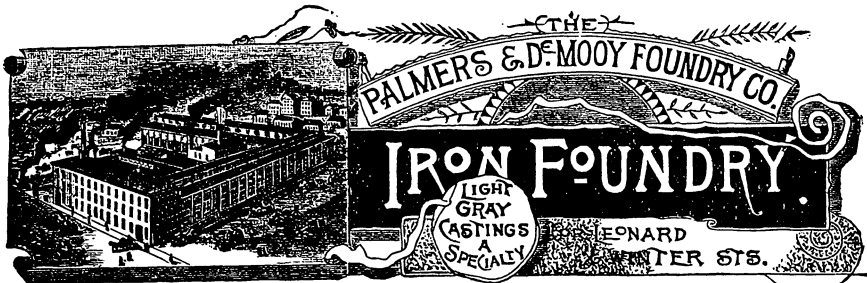
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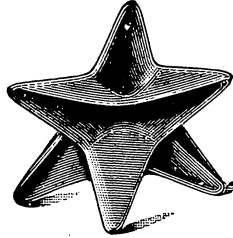
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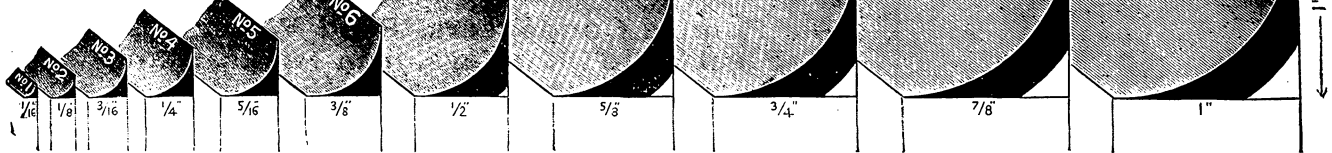
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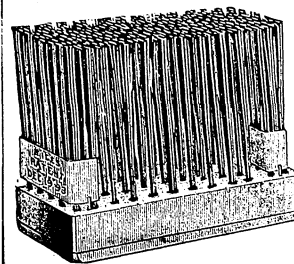
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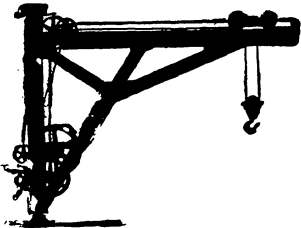
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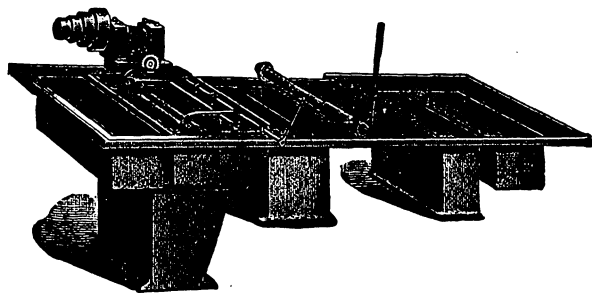
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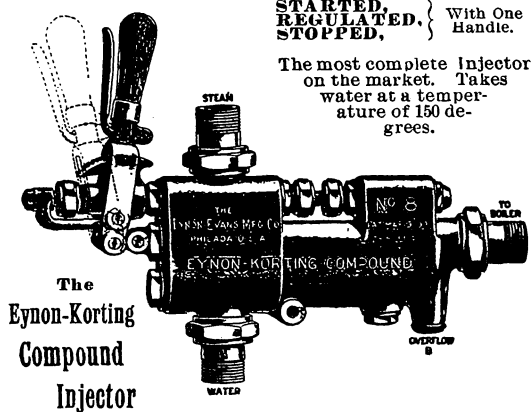
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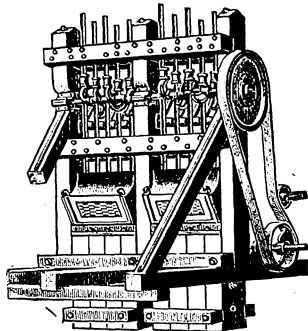
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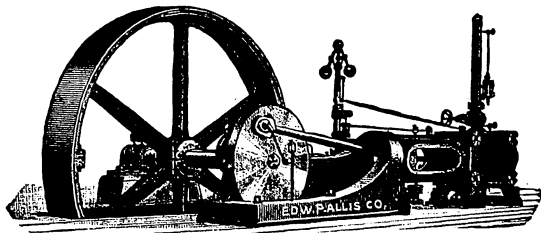
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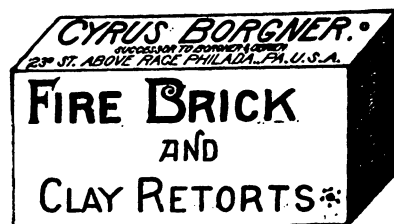
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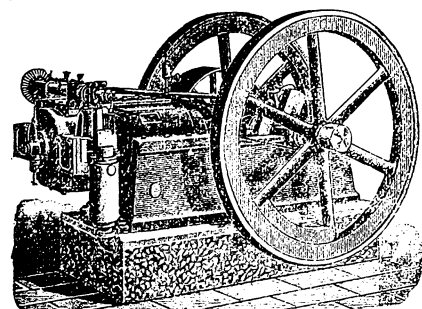
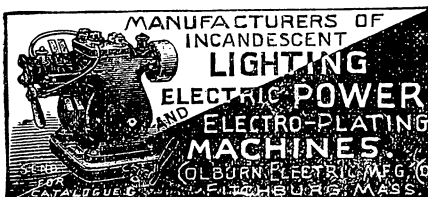
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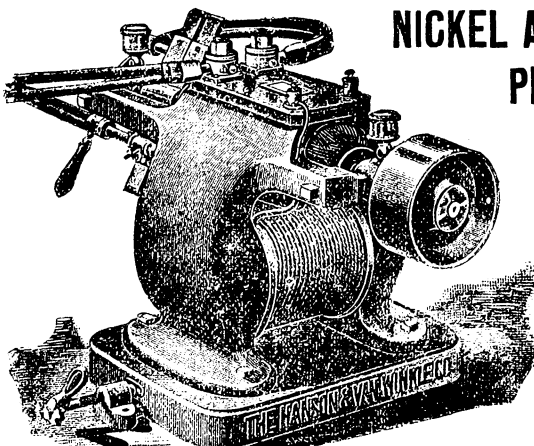
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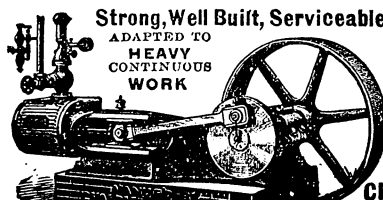
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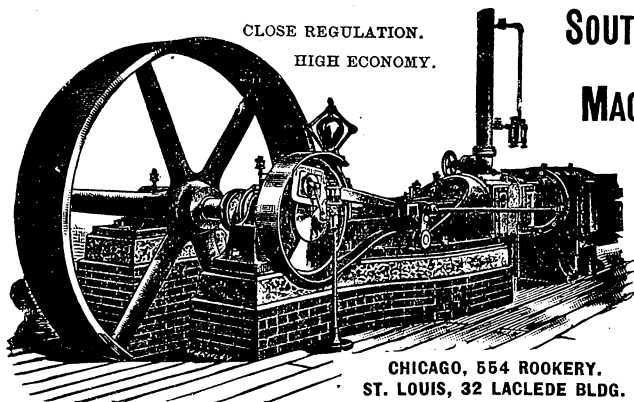
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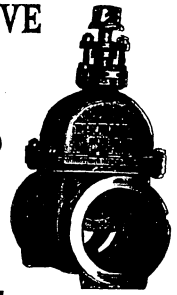
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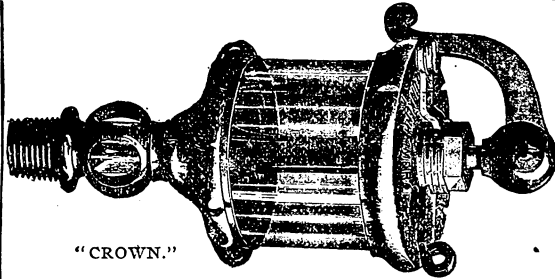


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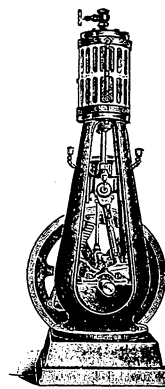
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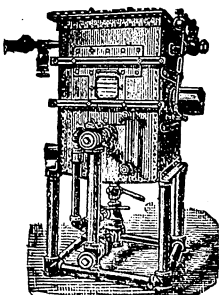
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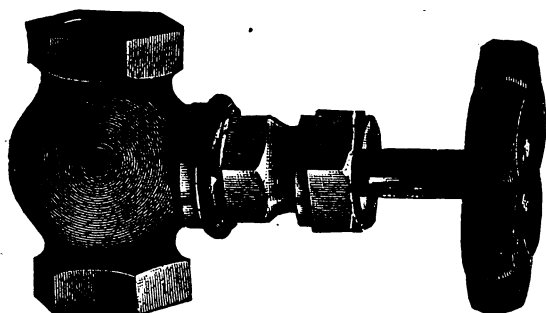
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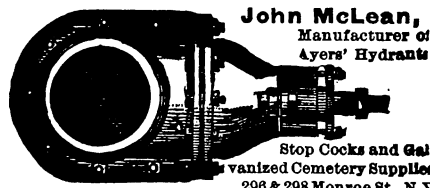
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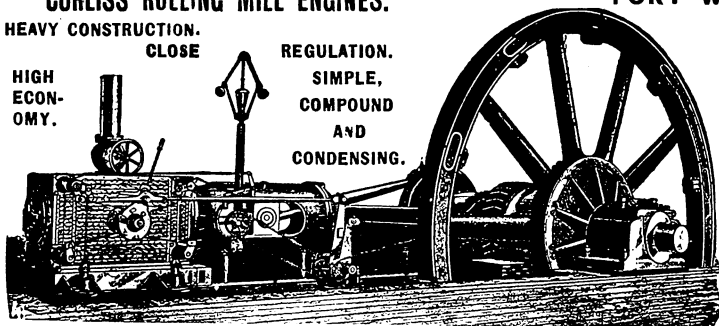
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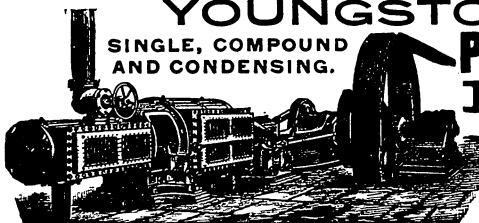
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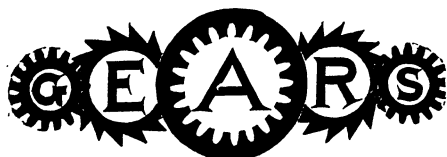
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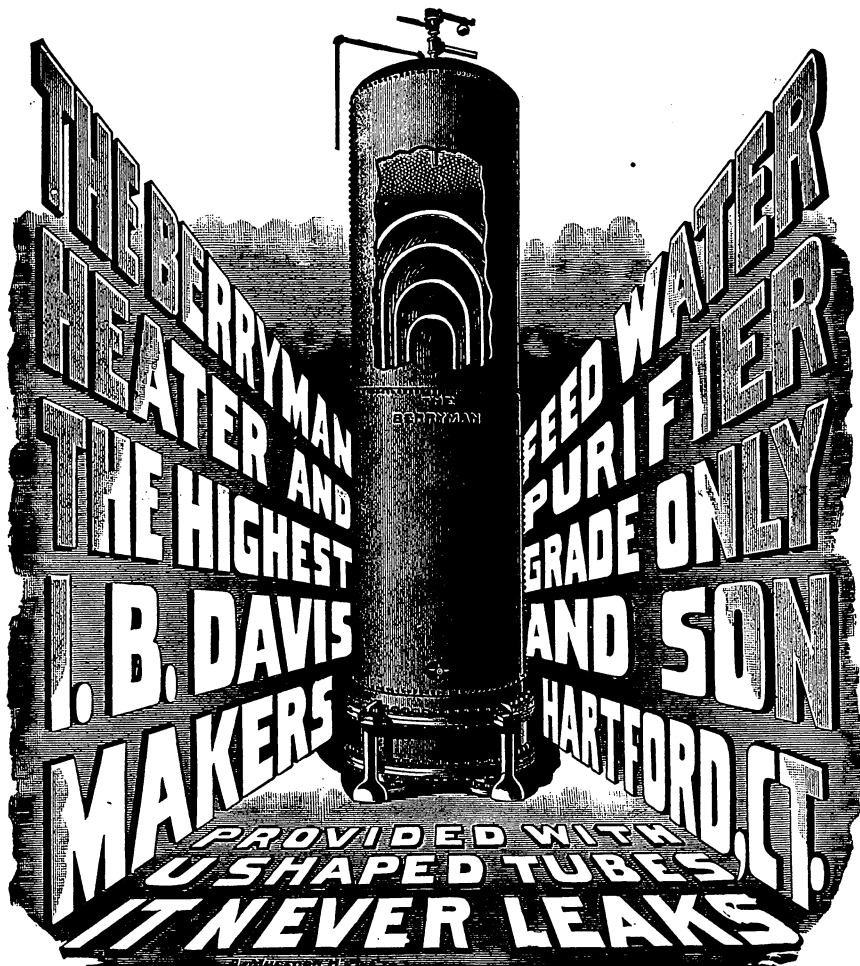
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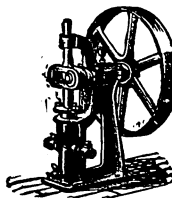


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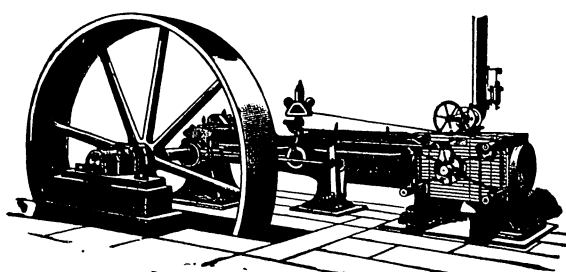
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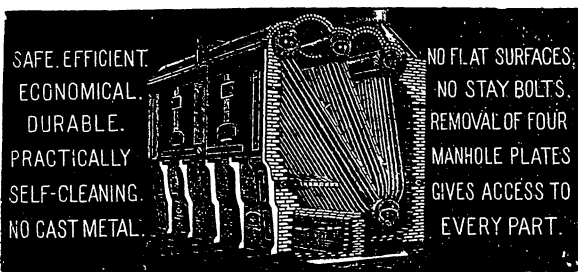
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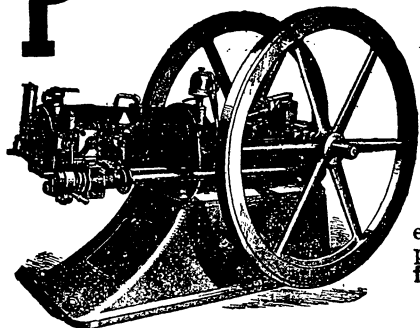


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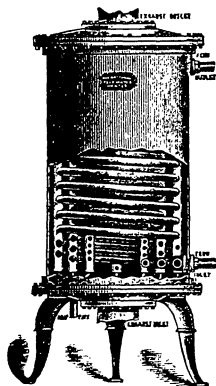
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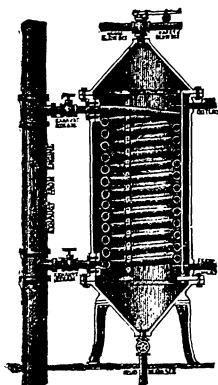
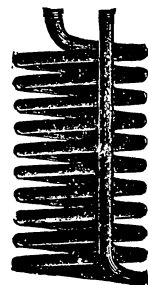
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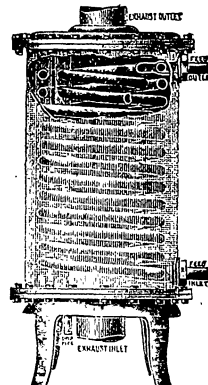
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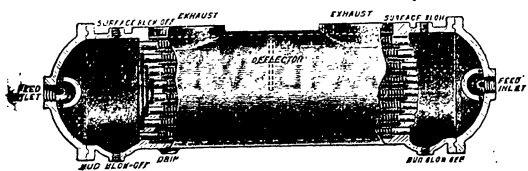
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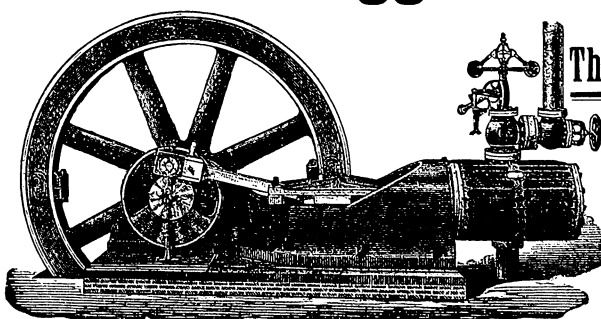
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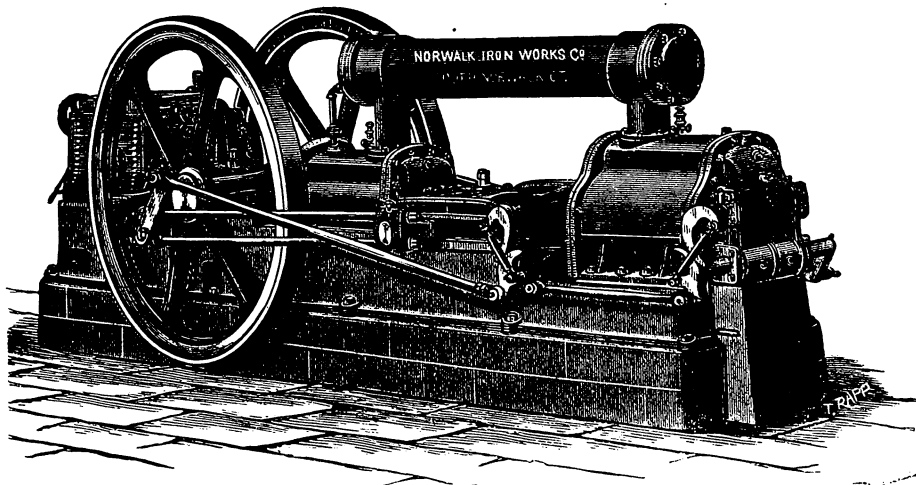
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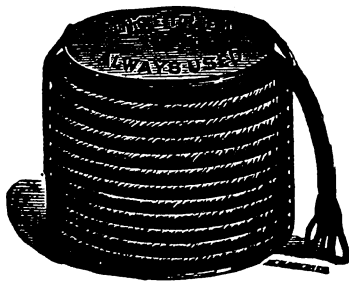
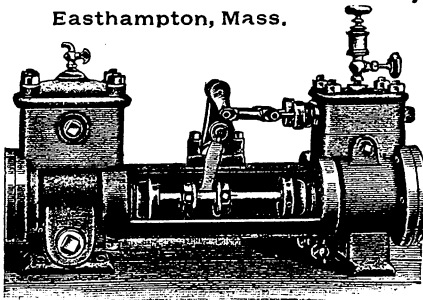
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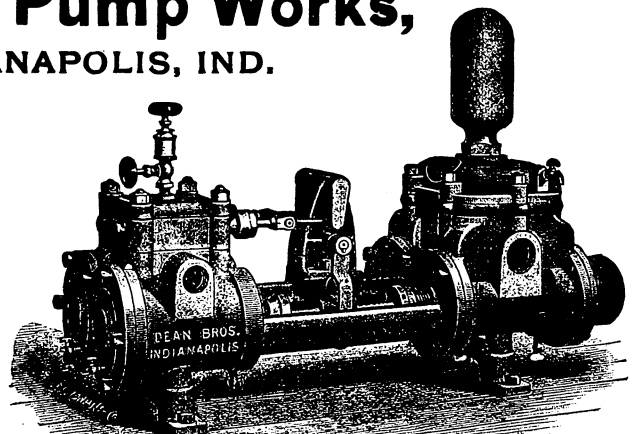
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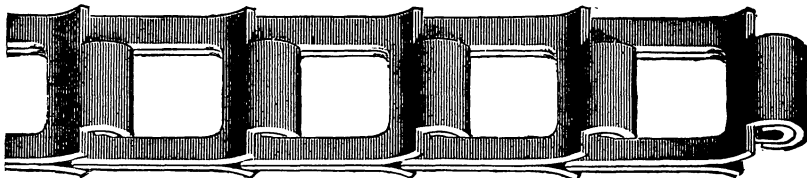
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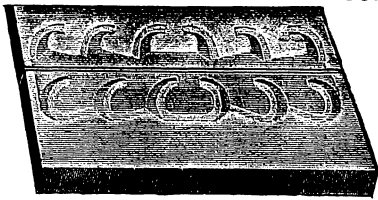
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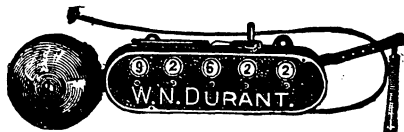


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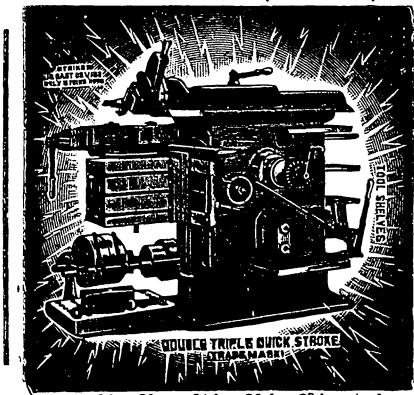
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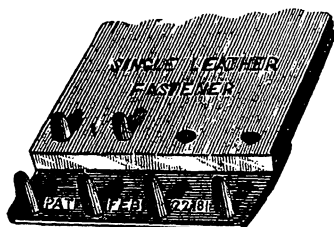
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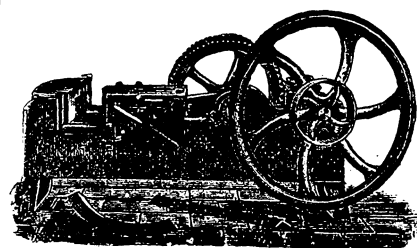
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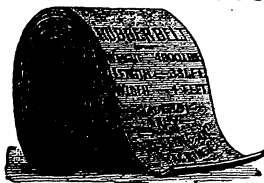
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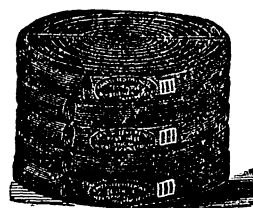


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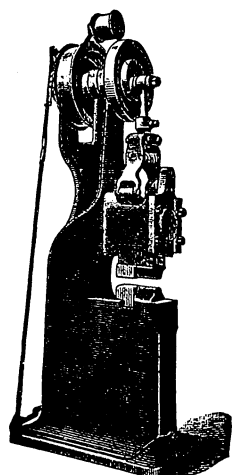
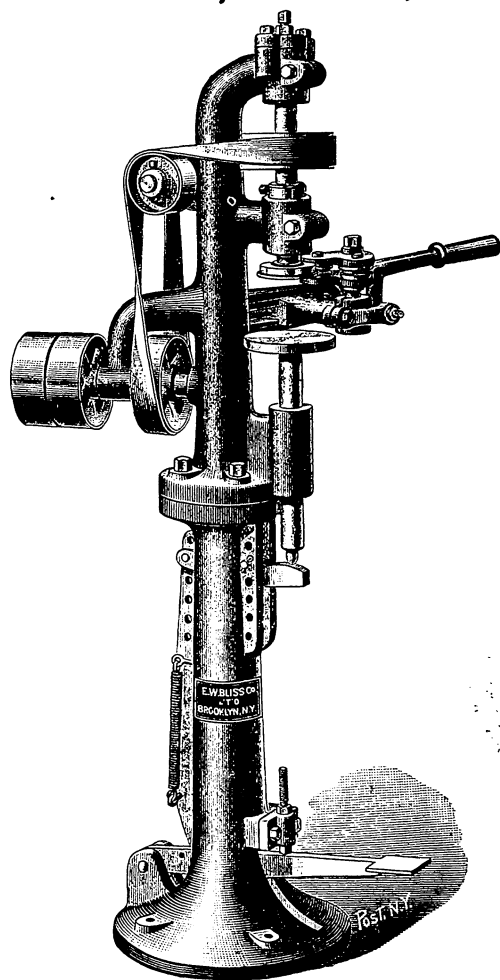
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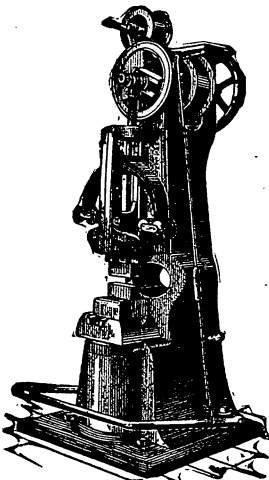
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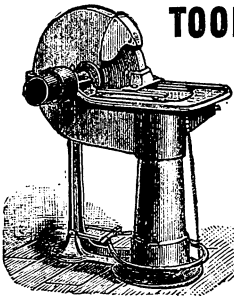
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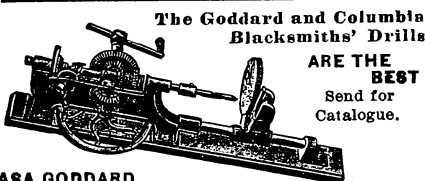
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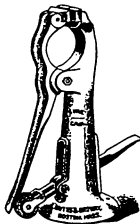
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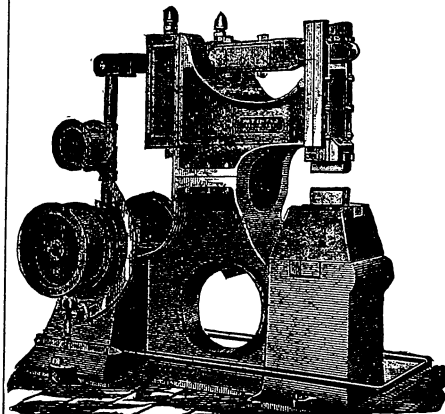
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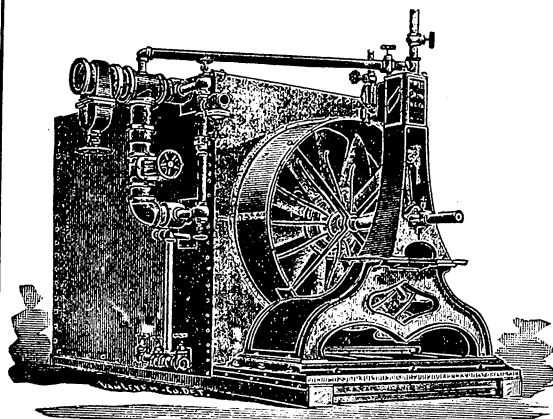


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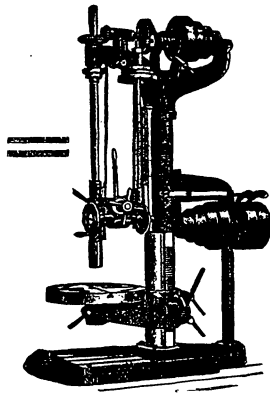
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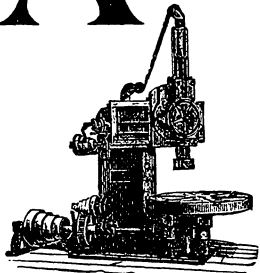
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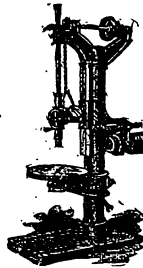
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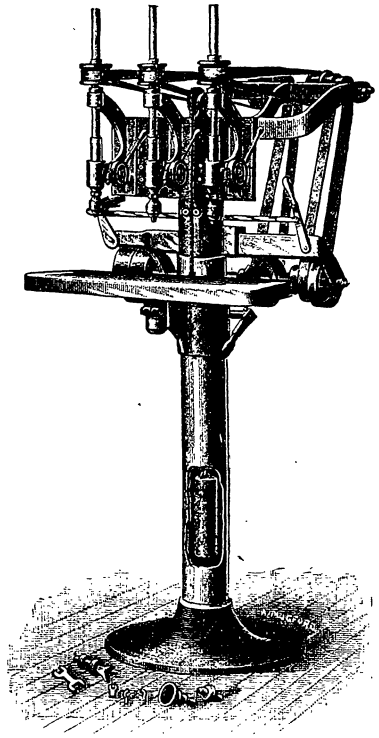
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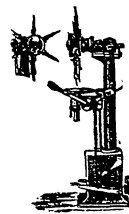
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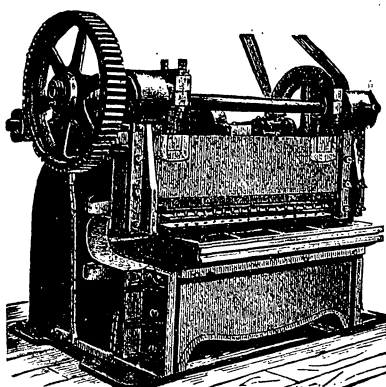
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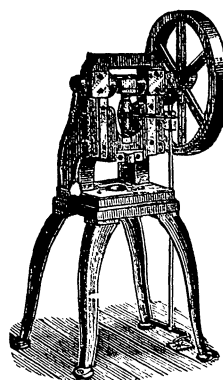


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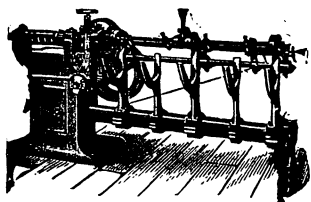
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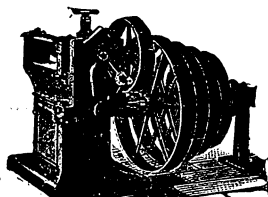
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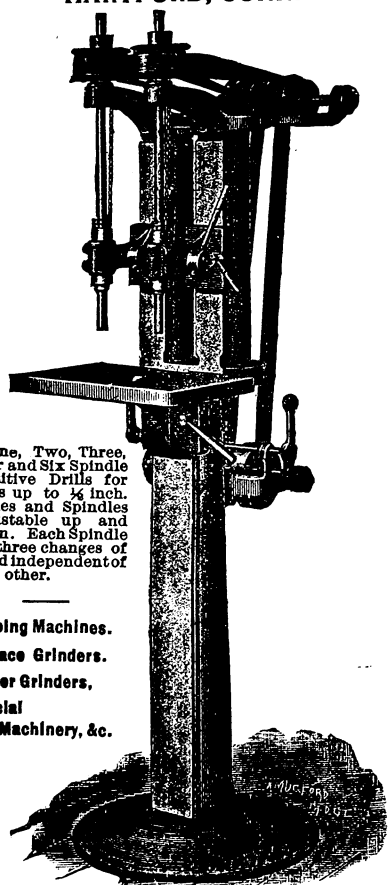
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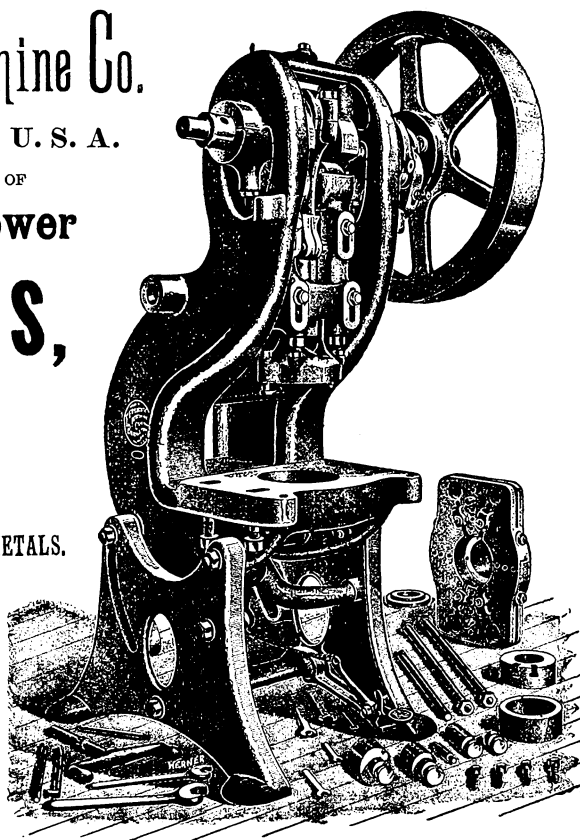
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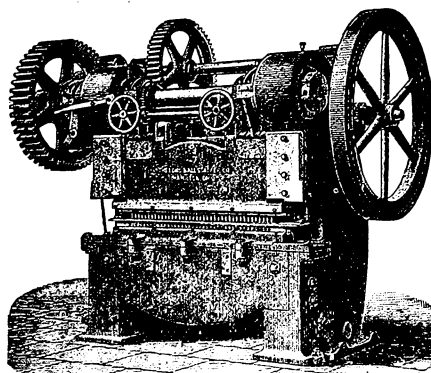
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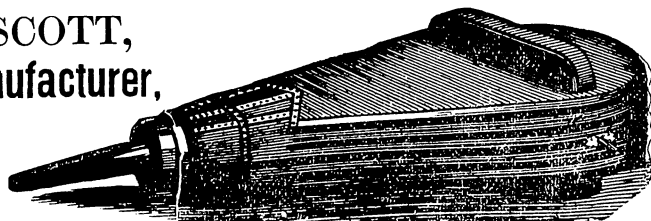
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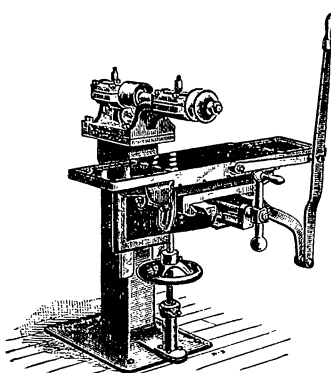
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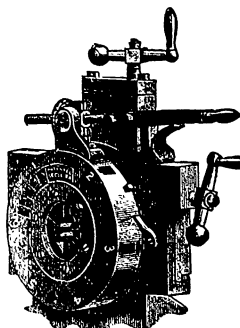
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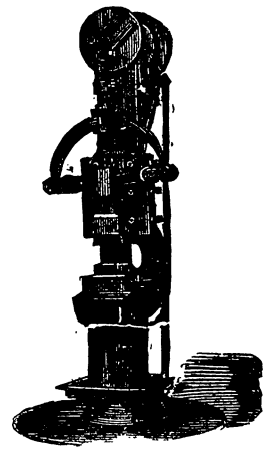
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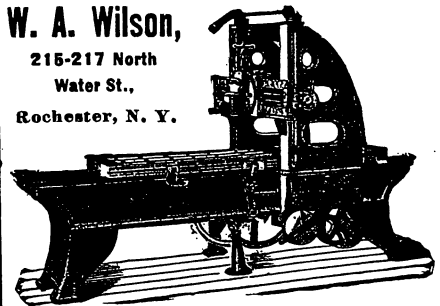
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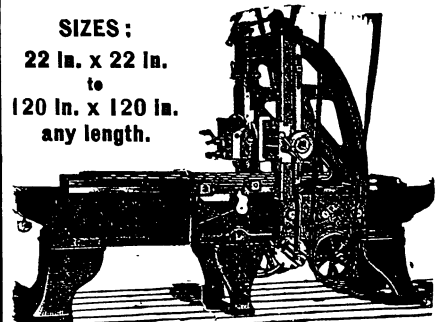
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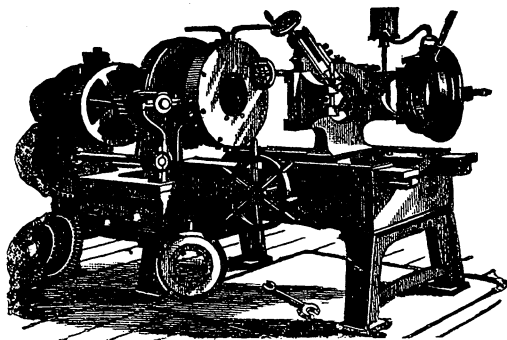
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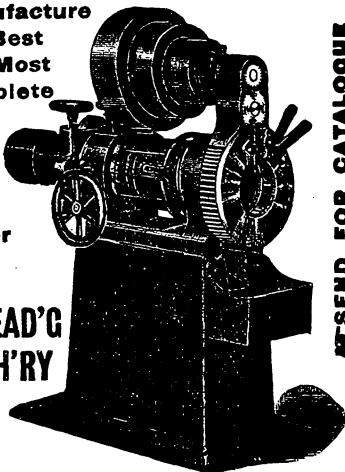
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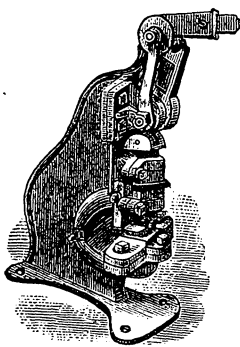
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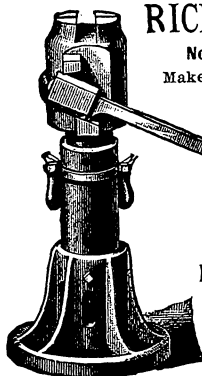
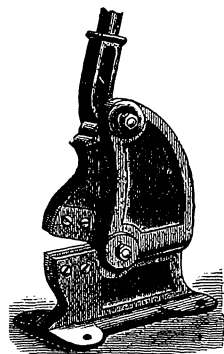


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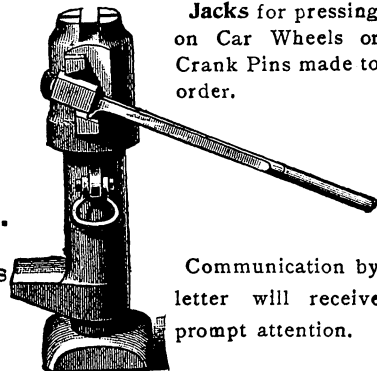
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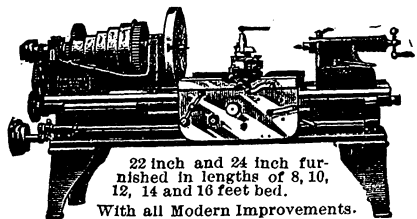
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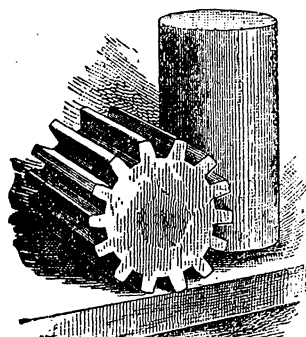
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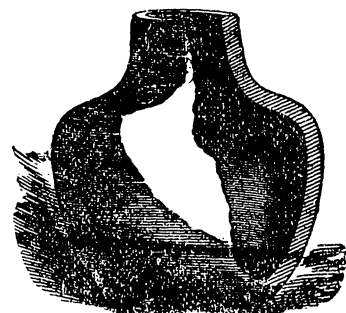
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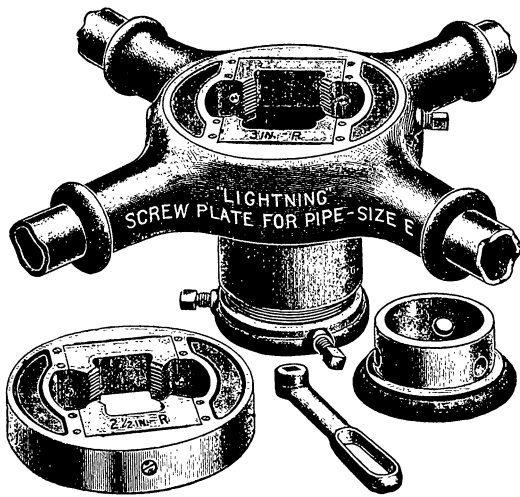
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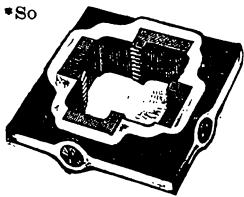
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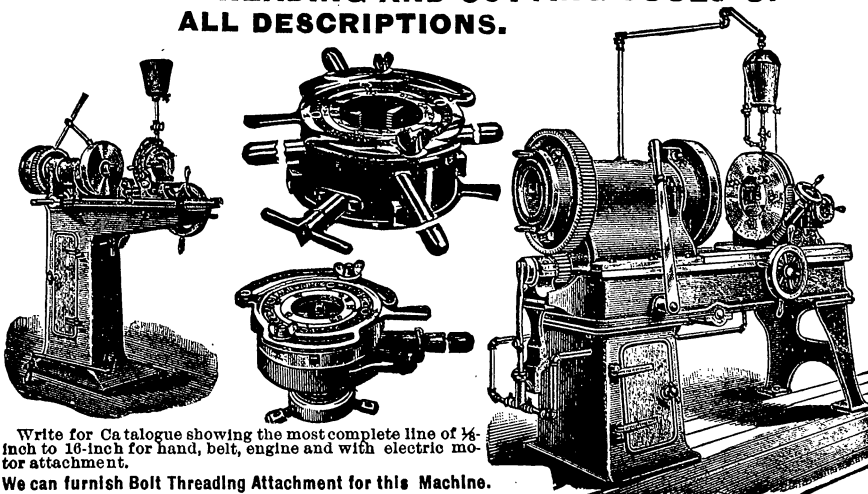
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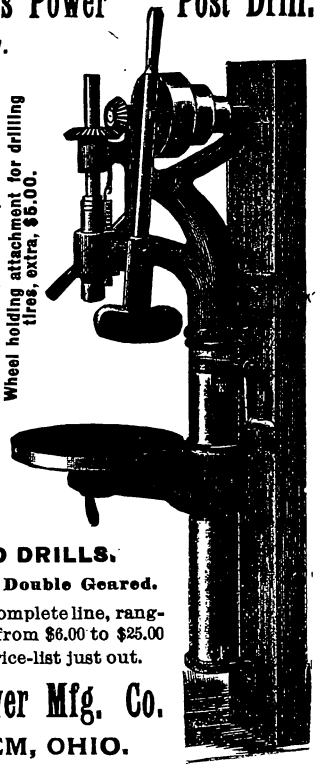
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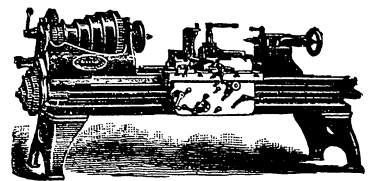
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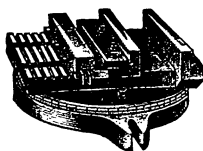
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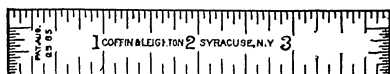


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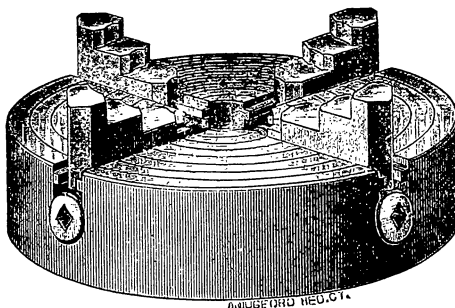
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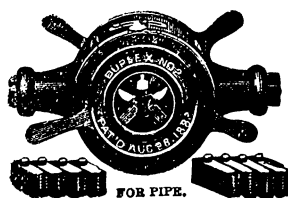
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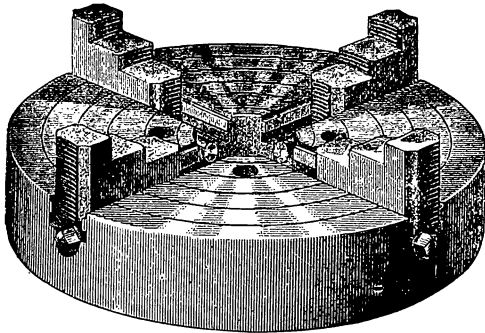
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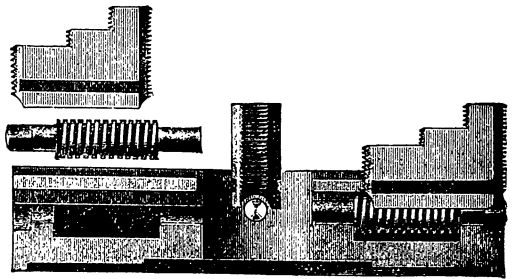
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CONTENTS.

The Pattern Maker and His Trade.  
The Pattern Shop—Its Position, Size and Requirements.

Marking and Recording Patterns.

Printing-Press Cylinders.

Differential Chain Pulleys.

A Handy Tool for Laying out Hexagon Nuts.

How to Cast Journal Boxes on Frames.

How to Strike an Arc by the Aid of Three Points.

Key-Heads for Motion Rods—The way to lessen the cost of their production.

Elbow and Tee Pipes—A quick method for turning the patterns and core boxes in the Lathe.

Slide-Valve Cylinders.

Corliss Cylinders—With a full description, showing how to construct patterns and core-boxes which can be changed at short notice for different stroke engines.

Fly Wheels—Different styles.

Engine Frames—How to build the pattern to serve for various strokes.

Spur Gears—How the teeth should be made.

Bevel Gears—The manner of laying them out.

How to Lay Out the Thread of a Worm for the Pattern.

Worm Wheels—The way to get the angle of teeth and the manner of fastening them on.

Sweeping Straight Winding Drums.

Making Winding Drums from Patterns.

Making Sheaves from Core Boxes.

Making Sheaves from Patterns.

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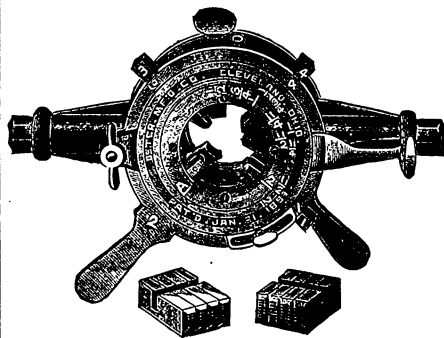
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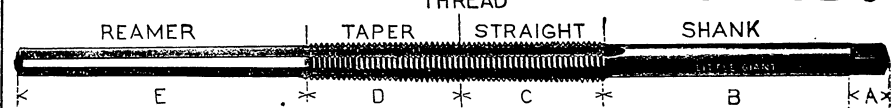
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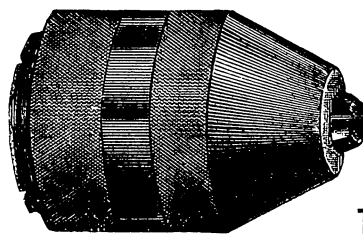


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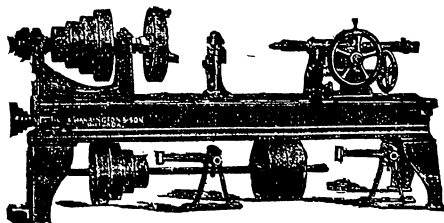
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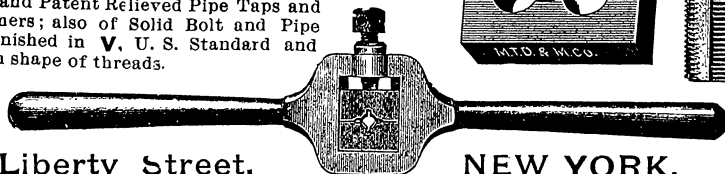
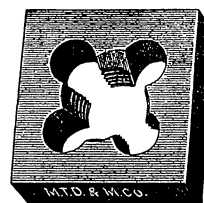
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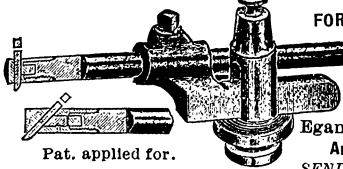


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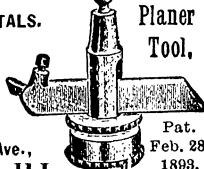
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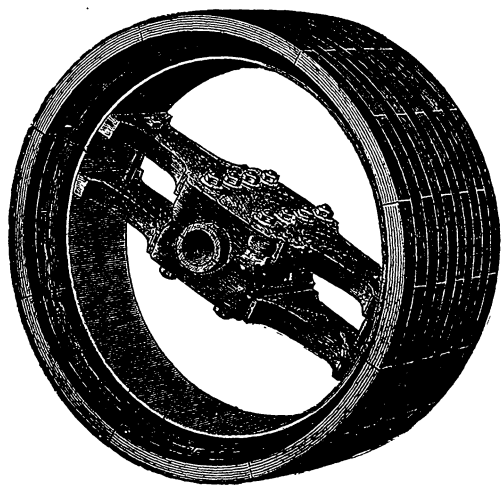
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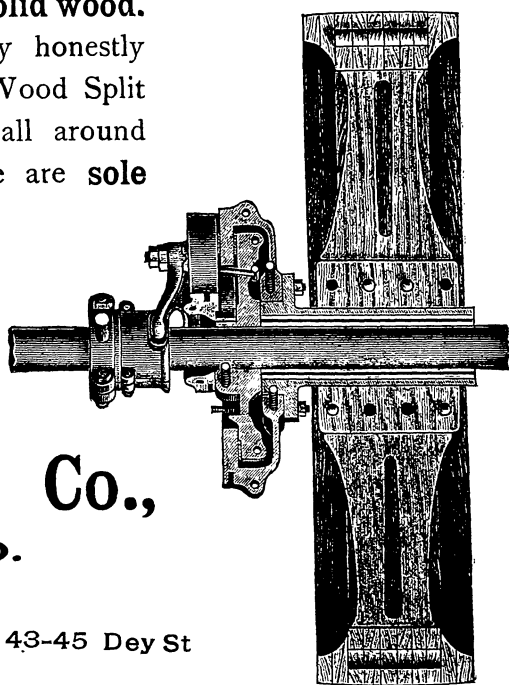


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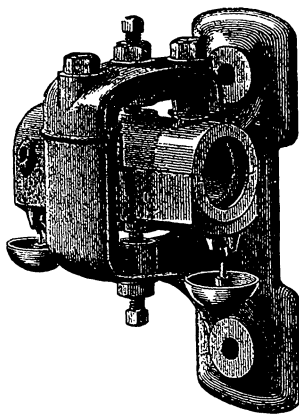
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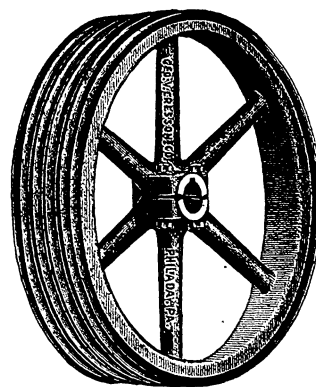
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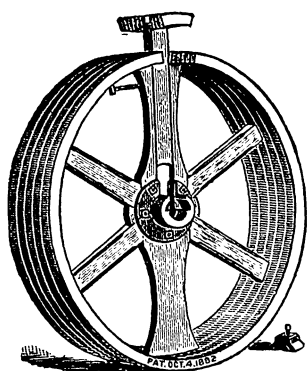
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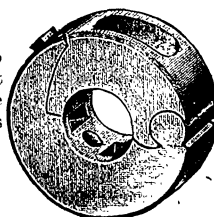
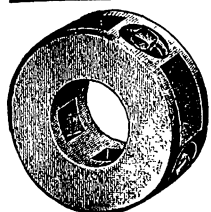
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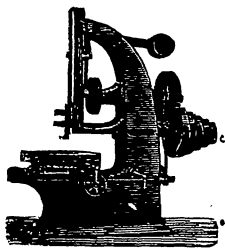


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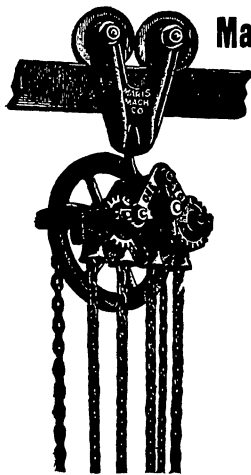
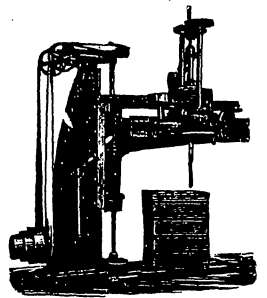


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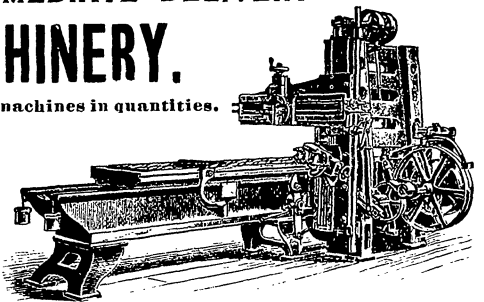
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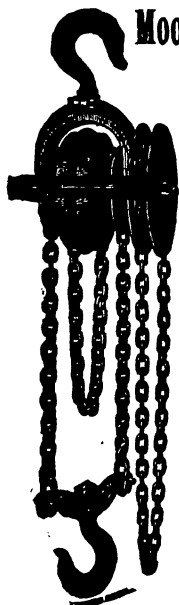
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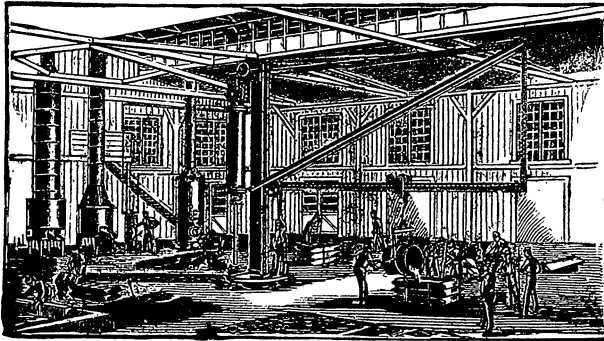
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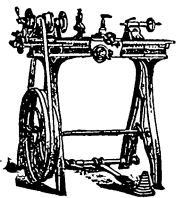
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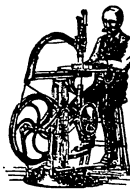
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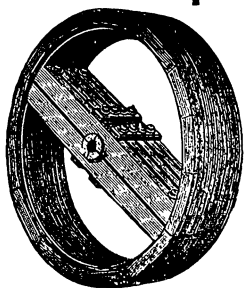
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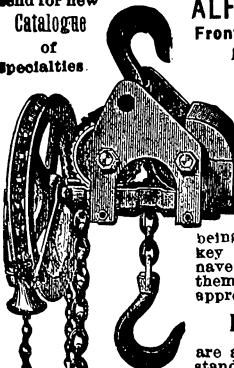


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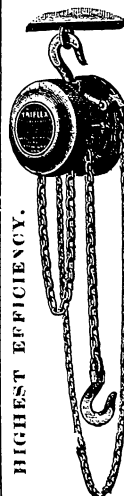
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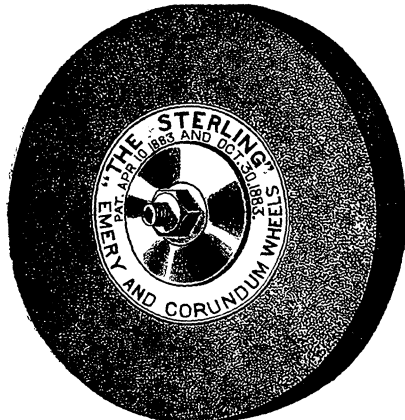
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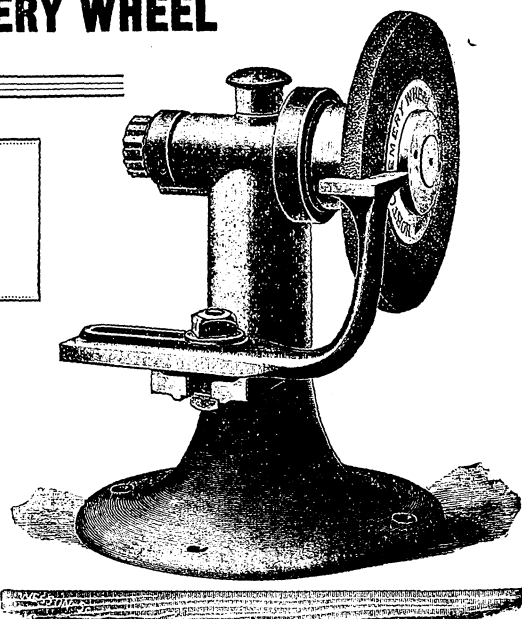
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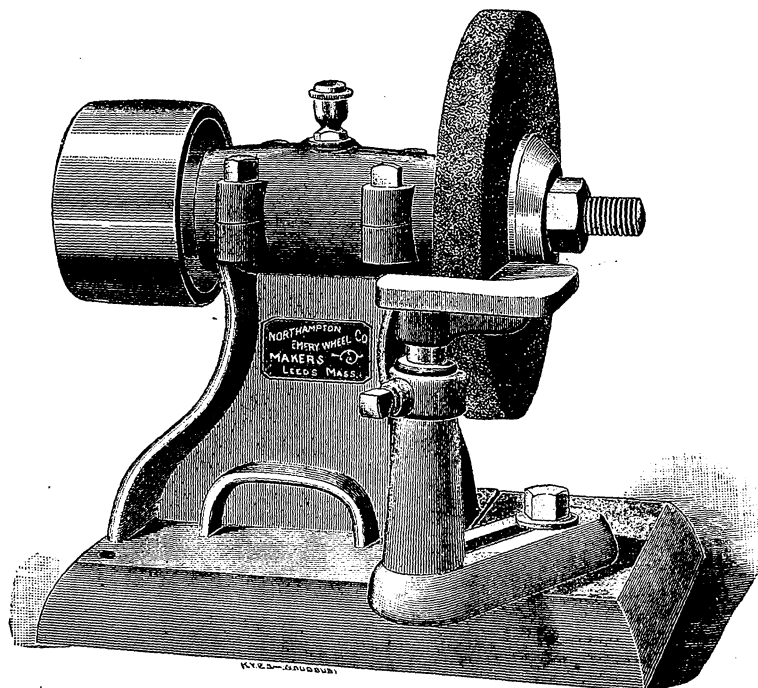
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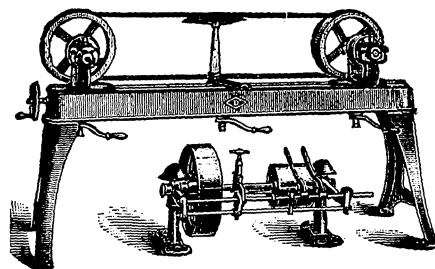
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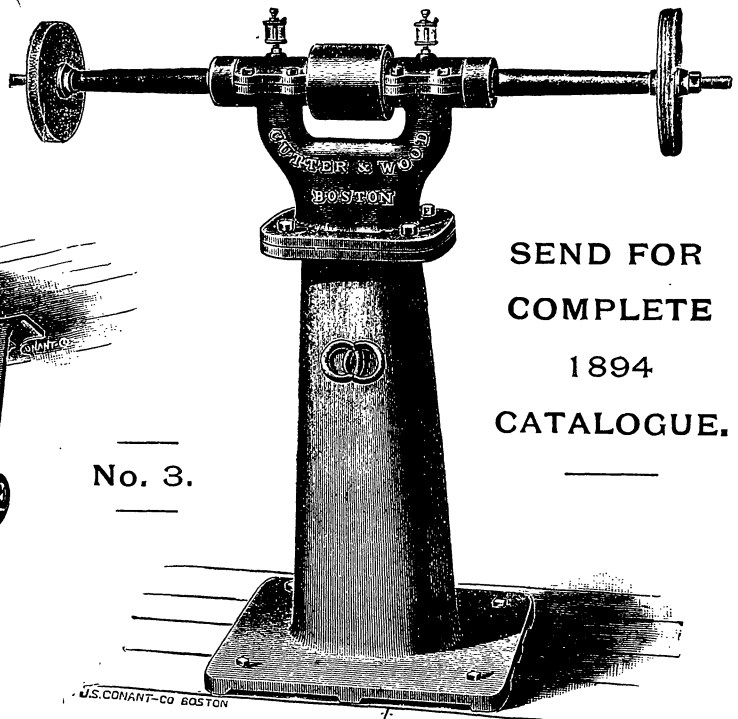
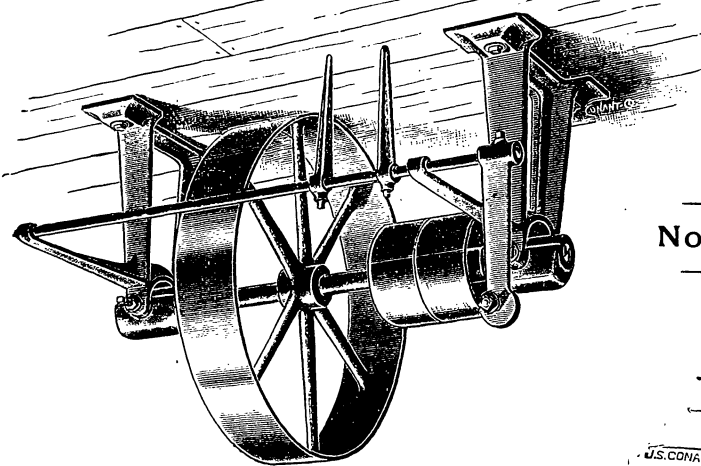
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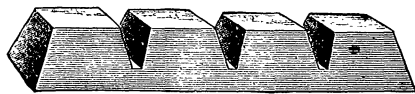
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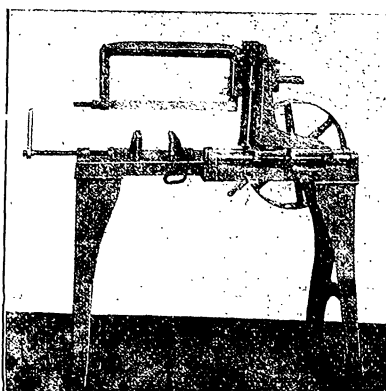
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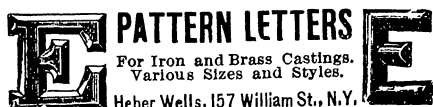


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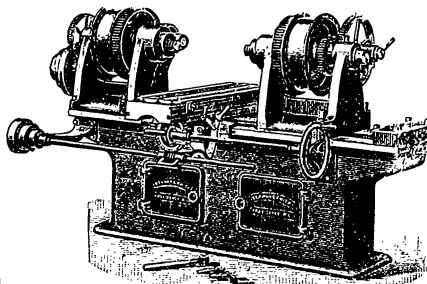
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20 in. x 20 in. x 5 ft. Ames.  
22 in. x 22 in. x 4 ft. L. W. Pond.  
24 in. x 24 in. x 6 ft. Whitcomb.  
24 in. x 24 in. x 5 ft. Putnam.  
28 in. x 28 in. x 7 ft. New Haven.

### SHAPERS.

10 in. Juengst Crank.  
10 in. Wood & Light Traverse Head  
15 in. Kelly Crank.

Also a large number of other machines. Write for complete list and detailed description.

### THE GARVIN MACHINE CO.,

Laight and Canal Sts., New York.  
Also 51 North 7th St., Philadelphia, Pa.

### !!! FOR SALE. !!!

**BAKER BLOWERS**, Nos. 3, 4, 5, 6 1/2, 7 and 7 1/2.  
**ROOT BLOWERS**, Nos. 1, 2, 3, 5, 6 and 7.  
**CAMERON VACUUM PUMP**, 16 in. x 24 in.  
**KNOWLES PUMP**, 14 in. x 10 in. x 12 in.  
**NIAGARA PUMP**, 9 in. x 5 in. x 10 in.  
**1 No. 9 CLAYTON DUPLEX AIR COMPRESSOR**, 22 in. x 24 in. x 30 in.  
Horizontal Boilers, 18 ft. x 6 ft. 7 ft. x 3 ft. Fixtures.  
Locomotive Boilers, 20, 40 and 100 H. P.  
Machinery Buyers write to  
C. R. BIGELOW, Machinery Expert,  
45 Day St., New York City.

### FOR SALE.

#### SECOND-HAND MACHINERY

Nos. 1, 2, 5 and 6 Roots Blowers.  
9 in. x 9 in. Fitchburg Vertical Engine.  
54 in. x 9 ft. Vertical Boiler.  
H. P. Baxter Engine and Boiler.  
1 24 in. x 25 ft. bed Engine Lathe.  
1 24 to 14 in. open die Bolt Cutter.  
Low prices.

COOKE & CO.,

163 and 165 Washington St., New York.

## FOR SALE.

Lathe, 52 in. swing, 40 ft. long, triple geared.  
New Steam Engines, 16 x 24, 14 x 24, 12 x 24, 6 x 12.  
Rebuilt Engines, 14 x 24, one pair 4 x 8.  
Five hundred iron pulleys 10 ft. dia. and less.

WM. A. BOLE, Trustee,

25th St., Cor. Liberty Ave., Pittsburgh, Pa.

## FOR SALE.

2 Double Deck Boilers about 40 H.-P. each, cheap. Hoisting Engine. Cylinder Boilers for Stacks, 30, 36 and 42 in. diameter. Round and Square Iron Tanks. Blow Offs. 5 Brass Cannons about 1400 or 1500 pounds each. Good order. All kinds of Scrap Iron and Metals on hand.

BUSSENIUS & CUNLIFFE,

12th and Washington Ave. Philadelphia.

## ALUMINUM GOODS

AND small CASTINGS in quantity to order. No goods for sale. All kinds of novelties made. If you are after information, enclose stamp. THE H. H. FRANKLIN MFG. CO., Syracuse, N. Y.

### A FEW BARGAINS.

One "Yale" Traveling Crane, 10 ton cap. One 200 lbs. "Peck" Drop Hammer and Lifter. One Universal Milling Machine. One Polishing Rumbling Barrel, for liquid. Also Boilers, Engines and Flywheels.

G. W. SCHULTZ & CO.,  
308 Walnut St., PHILADELPHIA

## FOR SPECIAL BARGAINS

In second-hand Drop Presses, Power Presses Dies and Tools for Sheet Metal Workers, also Boilers, Engines, both Portable and Stationary, Wood Working Machinery, etc., apply to

J. M. KRAMER & BRO., Machine Works,  
Maria Stein, O.

**SECOND-HAND MACHINERY.****ENGINE LATHES.**

10 in., 11 in. and 13 in. Swing, 4 and 5 ft. Bed Lathes, Reed, Prentice and L. & M.  
15 in., 16 in., 18 in., 19 in. and 20 in. Swing, 6 and 8 ft. Bed Lathes, Dustin, Pond, Young, Ffield and Bullard.  
24 in., 26 in., 28 in., 32 in. and 36 in. Swing, 10 ft., 18 ft. and 18 ft. Bed Lathes Ffield, Dustin, Blaisdell and Perkins.

**PLANERS.**

1 17 in. x 17 in. x 30 in. Hand Planer.  
1 16 in. x 16 in. x 3 ft. Crank Planer.  
1 17 in. x 17 in. x 3 ft. L. & M. Planer.  
1 20 in. x 20 in. x 4 ft. L. & M. Planer.  
1 24 in. x 24 in. x 6 ft. Pease Planer.  
1 27 in. x 27 in. x 5 ft. White Planer.  
1 60 in. x 60 in. x 22 ft. Heavy Planer with 4 heads.  
1 60 in. x 60 in. x 22 ft. Hepworth, 1 head.  
1 8 ft. Boring and Turning Mill with pulley attachment.

**DRILL PRESSES.**

2 20 in. Drill Presses, Prentice & Davis.  
1 20 in. x 36 in. Gap Lathe.  
3 Slat Drills, 1 one spindle, 2 two-spindle.  
2 Pratt & Whitney 1 and 2 spindle.  
6 bench Drills.  
1 50 in. Heavy Geared Post Drill.  
1 each No. 2, 3 and 4 Garvin Gang Drills.

**SHAPERS.**

15 in. Stroke, Smith.  
15 in. G. & E. Make.  
17 in. and 24 in. Chase & Hendy.

**SPEED LATHES.**

10 in., 12 in. and 14 in. Swing, 3, 4 and 5 ft. Beds, Garvin and Spencer.

ALSO LARGE STOCK NEW TOOLS.

**THE NILES TOOL WORKS CO.**  
Eastern Branch, 136, 138 Liberty St., N. Y. City.

**RAILS FOR SALE.****NEW AND SECOND-HAND**

Relaying rails of all sections. Second-hand **Cut Rails for Builders' Use.** Also a small second-hand Engine and Boiler for sale.

J. H. RICHARDSON &amp; CO.,

Pittsburgh, Pa.

**SECOND-HAND MACHINERY FOR SALE.**

Planers, Drills and Lathes, good as new, for cash.

DIETZ, SCHUMACHER &amp; CO.,

Cincinnati, O.

**FOR SALE CHEAP.**

A lot of Rolling Mill Machinery, Engines, 30-inch Plate Trains, Shears, Testing Machines, Cranes, Pumps, Electric Light Machines, Sturtevant Blower, etc., etc. Full particulars by applying to

MATTHEW GILL, Jr.,

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**FOR SALE.**

A new iron building for immediate shipment, 81 ft. wide, 200 ft. long, consisting of a main span 61 ft. wide, with lean-to on one side 20 ft. wide. The trusses are sufficiently strong to carry a line of shafting and light jib crane. This building is suitable for a Machine Shop, Tin Plate Mill, Rolling Mill, etc. For further information address

SHIFFLER BRIDGE CO.,

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**WANTED.**

To furnish reasonable estimates on specialties in light metal work.

CLARK & COWLES, Plainville, Conn.  
Manufacturers of Clock Trimmings, Rivets, Springs &c.

**Manufacturer of Steam Heaters**

wants patterns and rights of good Hot Air Furnace. One having reputation preferred. Address "HOT AIR," office of *The Iron Age*, 98-102 Reade St., New York.

**BIG BARGAINS.****Second-hand Machinery For Car Shops.**

1 36 in. 150 ton Hydraulic Wheel Press.  
1 Bement, Miles & Co. Single Axle Lathe.  
1 36 in. Bement, Miles & Co. Car Wheel Borer with Hand Crane.  
1 No. 6 J. A. Fay & Co. Car Mortiser and Borer.  
1 J. A. Fay & Co. Car Tenoning Machine.  
1 J. A. Fay & Co. No. 2 1/4 Pacific Planer and Matcher.  
1 J. A. Fay & Co. Universal Horizontal Car Borer.  
1 J. A. Fay & Co. No. 4 Tenoning Machine.  
1 Lane & Bodley Large Car Mortiser and Borer.  
1 1 inch Double National Bolt Cutter.  
1 J. A. Fay & Co. Vertical 3-Spindle Car Borer.  
Write for full list of new and second-hand Wood and Iron Working Machinery.

U. Baird Machinery Co.,

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**For Sale, Very Low for Cash.**

1000 tons relaying 60-lb. Steel T Rails, 500 tons relaying Steel Street Rails, side bearing, 35 to 47 lbs. sections. Also 3 tanks 7 1/2 ft. diameter, 10 ft. high.

WM. H. PERRY &amp; CO., Providence, R. I.

**FOR SALE.**

One steel screw 25 ft. long, 12 in. diameter, 2 in. pitch, double square thread, with bronze nut 36 in. long fitted to a sliding head, sliding on planed ways. The screw has on one end a long thrust bearing or collar solid on shaft. This is fitted into brass boxes with a thrust block. On extreme end is a heavy gear wheel. There is also a pair of large pulleys with friction clutches for driving the same, also for reversing the motion.

This rig was built for cold drawing large shafting or tubing. The whole outfit will be sold cheap, as we have no further use for it. It is first-class in every particular. Address

THE PAIGE TUBE COMPANY,

Warren, O.

**Sturtevant Blower For Sale.**

No. 9 Sturtevant Monogram Blower. Used but six months. Practically new.

PHOENIX HORSE SHOE CO.,

JOLIET, ILL.

**For Sale. ALMOST NEW.**

6 ft. Pond Boring Machine.  
No. 1 Betts Horizontal Boring Machine.  
48 in. x 48 in. x 12 ft. Sellers Planer.  
30 in. x 9 ft. Harrington Engine Lathe.  
PHILADELPHIA MACHINERY & SUPPLY CO., 19 N. 7th St., Philadelphia.

**ROLLING MILL FOR SALE OR LEASE.**

Located in Chicago, within easy teaming distance of city warehouses and large consumers. Railroad facilities, first-class, connecting with every road entering the city. Well equipped, having one 10 in. and one 18 in. three-high train and an 18 in. muck train. Capacity, 75 tons a day. Mill can easily be adapted to specialties. Owners will take part pay in product. Address

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**EXECUTOR'S SALE**

of Hardware, Plumbing and Metal Working business to close estate of late James G. Burt. Business established twenty years. Stock and fixtures \$20,000 to \$25,000. A rare opportunity for investment in paying business in "Sunny California." Address

D. A. MOULTON, Executor,

San Bernardino, Cal.



We can save you money on new or second hand tools. Get our prices before buying.

**THE LODGE & DAVIS MACHINE TOOL CO.,**  
CINCINNATI, O., U. S. A.

**PITTSBURGH SALES AGENCY,**

J. H. HILLMAN, Manager,

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Pittsburgh, Pa.,

Offers for sale at very low prices **BESSEMER STEEL WORKS** and **STRUCTURAL STEEL MILLS**, also **STEEL MILL** for Rolling Bars and cold rolling, two **BLAST FURNACES**, a **RUSTLESS IRON WORKS**, interest in **TIN MILL** in INDIANA, **TUBE WORKS** and numerous other manufacturing interests and large quantity of very desirable **COAL PROPERTIES**, improved and unimproved.

**Dealers in Coal and Iron Lands.**

Examinations and Reports

on Properties.

References on Application.

**TO LET FOR MANUFACTURING USES.**

At South Easton, Pa., on line of Lehigh Valley Railroad and on Lehigh Canal. Sidings in buildings. Electric light. Electric street railway. One main 2-story building, 275 ft. x 45 ft. Steam Engine, Shafting and complete appurtenances for first-class factory or machine shop. One high 1-story building, 80 ft. x 45 ft. Cement floor. One 2-story building, 35 ft. x 45 ft., ground floor suitable for smith shop, etc.

These buildings were erected for galvanizing and barb wire plant, and more recently, for several years, have been in the occupancy of The National Switch & Signal Co. They form part of the plant of The Stewart Wire Co., being separated from its main plant by the Lehigh Canal. Affords a most desirable opportunity for industry using wire in any of its forms and is an exceptionally fine location for manufactory of any character.

Will be let in whole or in part, with or without the adjacent thoroughly equipped and complete Wire Drawing Mill, steam and water power, situated on same side of Canal. For further particulars address

THE STEWART WIRE CO.,

Easton, Pa.

**FOR RENT.**

Factory, 40 x 140, two stories, 3/4 acre lot, two side tracks, 50 H. P. engine and boiler. Suitable for bolt, hardware manufactory or foundry, \$600 per year for five year lease. Bolt machinery.

PETER SAMES,

Rockford, Ill.

**FOR SALE CHEAP.**

All new. 230 Hardware Drawers, including cases for same. Sickmess cause for selling. Address C. SMITH, L. Box 2, Bellevue, O.

ADJOURNED RECEIVER'S SALE  
OF  
**Very Valuable Steel Ore Property**  
(LARGELY DEVELOPED).  
The subscriber, receiver of the  
**Champion Steel Ore Comp'y**  
Will sell at public vendue on  
**Tuesday, October 2nd, 1894**  
At One o'clock in the Afternoon,

on the premises of said Company, situated in Oxford Township, Warren County, New Jersey, a little east of the public road leading from Oxford Furnace to Belvidere (about one mile from Oxford, two miles from Belvidere and two miles from Buttsville), all that exceedingly valuable Mineral Lease, comprising 122 acres, having 23 years yet to run and including purchase privilege at any time during said term, thus canceling the royalty of 30 cts. per ton, together with the complete mining outfit, Machinery, Buildings, &c. The broad-gauge Mineral Railroad extends directly into the property and connects at Buttsville with the Lehigh & Hudson River R. R., which connects with the Del. & Lack. & Western and the Pennsylvania R. R. within short distances—1½ and 8 miles.

The machinery includes one 83-horse-power boiler, one 37-horse-power boiler, one 20-horse-power boiler, two Munday hoisting engines, one with double drum, two ore washers, 6-horse-power vertical engine, 12-horse-power horizontal engine, four steam pumps, railroad siding, lot of piping, valves, fittings, and all the usual appurtenances of a well equipped mining property.

The Champion mines produce a superior grade of Bessemer steel ore averaging 65% metal, and may be worked very profitably. The 12-foot solid ore vein alone, when reached and fully opened, should yield not less than 200 tons daily. There will also be sold about 200 tons of Bessemer ore, about 65% metallic iron. Also about 500 tons of tailings, running about 47% metal. Remember the lease is an exceptionally valuable one, covering and controlling as it does all the rich deposits and veins of ore underlying to great depth perhaps the 122 acres of mineral land. The Bethlehem Iron Co. have tested and used nearly 7000 tons of the Champion steel ore while the development work was being prosecuted.

Any one wishing to examine the property before or on the day of sale will find J. R. Eckmeyer, Superintendent, a responsible man, in charge, who will give all information needed.

JOSEPH R. ENCKE, Receiver,  
P. O. Address, Trenton, N. J.

EXECUTOR'S PUBLIC SALE OF A  
**Valuable**  
**Furnace Property**  
KNOWN AS THE  
**"COLERAINE IRON CO.,"**

Located at REDINGTON, PENNA.

WILL BE SOLD AT PUBLIC SALE,

At the Phila. Exchange, 3d and Walnut Sts., Phila.

On TUESDAY, Oct. 16th, at 12 o'clock,

The Furnace Plant known as the "Coleraine Iron Co.," situated at Redington, on the Lehigh Valley R. R., midway between Bethlehem and Easton. The Real Estate covers about 70 acres, on which are erected 2 Blast Furnaces, 4 Cooper Stoves, 44 pipes each (Boilers over Engine), 2 Nests, 3 Cylinder Boilers, 2 Double Plunger Pumps, Steam Hammer, large Stock-house and Stock-yard to each Furnace, large Car and Carpet Works, Blacksmith Shop, Stone Stable, Machine Shop, Pattern Shop and Foundry (with full line of Machines and Tools), Store Building and Office, Foreman's House, Manager's House, Superintendent's House, 20 Dwellings for Workmen, Stone Quarry, Also 25 Acres Farming Land, Cinder Dumpage, Railroad Tracks, Scales, etc., etc.

By order of the

FIDELITY INSURANCE TRUST AND SAFE  
DEPOSIT CO., Executors, Philadelphia.

BARNES & LOFLAND, Auctioneers,  
No. 147 So. Fourth St., Philadelphia.

**To Southern Iron Manufacturers.**

I have a method of utilizing Southern Pig Metal from a cold short to a neutral and from a neutral to a red short. I have used this method successfully at Roanoke, Va. for two years, without extra cost. Those desiring to give this process a trial can do so by addressing

DAVID R. MORGAN, Box 389,  
New Philadelphia, Ohio.

**WANTED.**

Hardware and Cutlery house with trade throughout the United States, to push the goods of German manufacturer and dealer in these lines. First class opportunity for live house. Address "CUTLERY," Box 920, office of *The Iron Age*, 96-102 Reade St., N. Y.

**WANTED.**

Upright Bar Shear and about a 40 H. P. Upright Engine. All in good condition. Address with full particulars P. O. BOX 954, Pittsburgh, Pa.

# Locations for Factories.

The name of the Chicago, Milwaukee & St. Paul Railway has long been identified with practical measures for the general upbuilding of its territory and the promotion of its commerce, hence manufacturers have an assurance that they will find themselves at home on the company's lines.

The Chicago, Milwaukee & St. Paul Railway Company owns and operates 8,150 miles (9,900 kilometers) of railway, exclusive of second track, connecting track or sidings. The eight States traversed by the company, Illinois, Wisconsin, Northern Michigan, Iowa, Missouri, Minnesota, South Dakota and North Dakota, possess, in addition to the advantages of raw material and proximity to markets, that which is the prime factor in the industrial success of a territory—a people who form one live and thriving community of business men, in whose midst it is safe and profitable to settle. Many towns on the line are prepared to treat very favorably with manufacturers who would locate in their vicinity.

Mines of coal, iron, copper, lead and zinc, forests of soft and hard wood, quarries, clays of all kinds, tan-bark, flax and other raw materials exist in its territory in addition to the vast agricultural resources.

A number of new factories have been induced to locate—largely through the instrumentality of this company—at towns on its lines. The central position of the States traversed by the Chicago, Milwaukee & St. Paul Railway makes it possible to command all the markets of the United States. The trend of manufacturing is Westward. Nothing should delay enterprising manufacturers from investigating. Confidential inquiries are treated as such. The information furnished a particular industry is reliable. Address

LUIS JACKSON,

Industrial Commissioner, C., M. & St. P. R'y,  
425 Old Colony Building, Chicago, Ill.

## FOR SALE,

in one of the best agricultural and fruit growing sections of California, a general stock of Hardware, Agricultural Implements. Stoves, Tinware, &c. Stock will now invoice about \$30,000, but can be reduced. Best of reasons for selling. Inquire of

W. W. MONTAGUE & CO., or DUNHAM,  
CARRIGAN & HAYDEN CO., San Francisco, Cal.

EUGENE V. N. BISSELL, Auctioneer.  
**E. BISSELL, SON & CO.,**

Successors to  
HAYDOCK & BISSELL,  
WHOLESALE

**HARDWARE AUCTIONEERS,**

19 Murray St. and 15 Park Place, N. Y.  
Sales held weekly for the trade. Consignments solicited. We refer to the leading manufacturers and importers.

## FOR SALE.

COUNTY or STATE RIGHTS for a very superior cheap portable steel or iron CULVERT BRIDGE. It is adapted to all small streams, runs, etc. It is just the thing to improve ROADS AND HIGHWAYS. It can be placed below or on the level with the road. It also makes a most excellent RAILROAD CULVERT, GUTTER CROSSING and CITY or TOWN CULVERT. Apply to

W. A. NICHOLS,  
Girard Building, Philadelphia, Pa.

**J. A. COLEMAN,**  
Author Coleman's Mechanic's Liens in Illinois  
Attorney at Law,  
82 Hartford Building, Chicago.  
MECHANIC'S LIENS EXCLUSIVELY

## WANTED.

Agency for a mill manufacturing standard goods of iron or steel and which have or desire to have a market in New England for their product.

M. T. DENHAM,  
Rooms 78 and 79 Mason Building, Boston, Mass.

## WANTED.

By a large manufacturing establishment some new specialty to make and sell to the Jobbing Hardware, Crockery or Grocery trade. Address

"NEW SPECIALTIES,"  
office of *The Iron Age*, 96-102 Reade Street, New York.

## FOR SALE.

A well established retail Hardware business. Located in a city, 150,000 inhabitants, Central New York Stock consists of a general line Builders' Hardware, House Furnishing and Shelf Goods. Will inventory about \$6000. Good location and cheap rent. Investigation solicited. Address

"POCKET AND TABLE CUTLERY,"  
office of *The Iron Age*, 96-102 Reade St., N. Y.

## Chicago Storage Warehouse.

General merchandise storage, with desk room if wanted, situate in wholesale district.  
Apply to

C. P. SHERWOOD,  
294-300 Franklin Street,  
Chicago, Ill.

## TO LET.

168 Church St., between Reade and Chambers Sts., New York City.

25 x 50 ft. store. Basement and sub-basement. All in good repair, fine location as salesrooms for hardware, bicycles, etc. Apply to E. A. CRUIKSHANK & CO., 176 Broadway, or T. A. & W. T. MATTHEWS, 14 and 16 Church St., New York City.

**WANTED, CHICAGO AGENCIES.**—A well known business man of financial responsibility, a good salesman, will establish Chicago office October 1st, and wishes to obtain agency of manufacturers of hardware specialties or regular hardware, or goods that can be sold to jobbers. Manufacturers seeking an outlet will find this an excellent opportunity. The commercial credit and business references of the party are first-class. Address "CHICAGO AGENCIES," office of *The Iron Age*, 96-102 Reade St., New York.

## WANTED.

A manufacturer wants to add to his line some new specialties that will sell to the Jobbing Hardware, Saddlery or Woodenware Trade. Address "JOB-BING TRADE," office of *The Iron Age*, 96-102 Reade Street, New York.

## Collections!

**ATTENTION! Merchants and Manufacturers.**—We collect your past due accounts. Do not let them remain too long upon your books. Send for our draft book.

**THE HARDWARE BOARD OF TRADE, Ltd.,**  
4 and 6 Warren street, New York.  
JAS. H. GOLDEY, Treas.

## LUXURY ON WHEELS.

Solid through trains between Cincinnati, Toledo and Detroit. Pullman Vestibuled Trains between Cincinnati, Indianapolis and Chicago. Through car lines from Cincinnati via Indianapolis to St. Louis; also Cincinnati via Indianapolis to Decatur, Springfield, Ills., and Keokuk. These are the only lines running Pullman Vestibule and Dining Cars between the cities named. See that your ticket reads via Cincinnati, Hamilton and Dayton.

WM. M. GREENE, Gen'l Manager,  
D. G. EDWARDS, Gen'l Passenger Agent  
Cincinnati, O.

**ADOLPH BUTZE,**  
Manufacturers' Agent.

**Railroad, Packing House and Contractors' Supplies.**

—AGENT FOR—

LATROBE STEEL WORKS, Locomotive and Car Wheel Tires. UNITED RUBBER CO., Hose, Packing, &c. GEO. GRIFFITHS CO., Shovels, Scoops, &c.  
Corrugated Galvanized and Sheet Iron, Plate, Tank and Bar Iron, Waste—White, Colored and Wool.

Bank of Commerce Bldg. St. Louis, Mo.

**The Williams**  
**Printing Co.,**  
**Commercial Printers,**  
**and Binders.**

Estimates Furnished for all Classes of Work.

96-102 Reade St., - New York.

**HELP WANTED.**

*Undisplayed Advertisements for Help Wanted not exceeding fifty words One Dollar each insertion. Additional words two cents each.*

**TRAVELING MEN** selling to the hardware trade (wholesale or retail) or to the general store trade, to sell our line on commission; for particulars address **BRANDENBURG & Co.**, Chicago, Ill.

**COMPETENT FOUNDRYMAN** who can invest some capital and take charge of established modern foundry; investment amply secured. Address "A. P. H.," No. 920, office of *The Iron Age*, 96-102 Reade St., N. Y.

**A MAN** to do enameling; one who thoroughly understands mixing, lining and firing. Address "ENAMEL," office of *The Iron Age*, 312 The Cuyahoga, Cleveland, O.

**AN EXPERIENCED STEEL SALESMAN** with thorough knowledge of crucible and open hearth product and its users; a responsible position is assured to the right party. Address "CONFIDENTIAL," P. O. Box 5821, Pittsburgh, Pa.

**A MAN AS FOREMAN** or assistant superintendent in a bolt works; must be able to handle men well, look after every detail and push all the time and at everything; none but a competent and experienced man need apply; to the right man a steady place is assured with chance for advancement; please state age, habits, references and compensation desired. Address "PUSH," No. 816, office of *The Iron Age*, 96-102 Reade St., N. Y.

**WANTED.**—Agents in New York, Pennsylvania, Ohio, Indiana and Michigan to carry a staple line of Hardware on commission. Address "EDWARDS," office of *The Iron Age*, 312 Cuyahoga Building, Cleveland, O.

**SITUATIONS WANTED.**

*Undisplayed Advertisements for Situations Wanted not exceeding fifty words Fifty Cents each insertion. Additional words one cent each.*

**AS GENERAL SUPERINTENDENT** or Manager of machinery, stove or engineering works; ability to take charge of manufacturing or executive departments; thorough practical knowledge of all details, handling men, systematizing work, economizing cost pricing, &c.; 15 years' experience; would prefer heavy concern requiring undoubted ability; first-class references. "D. H. E.," office of *The Iron Age*, 96-102 Reade St., New York.

**AN ACTIVE and ENERGETIC YOUNG MAN**, with wide experience as secretary and correspondent of corporations operating blast furnaces, Bessemer steel works, rolling and nail mills, desires a position with a manufacturing company where integrity, capacity and energy are required; best of references. Address "BESSEMER," office of *The Iron Age*, 96-102 Reade St., New York.

**A YOUNG MAN** having an extensive acquaintance among the foundries and machine shops of New England in selling pig iron, bar iron and steel, anticipates changing his position and is open for a new engagement where such experience will prove of the most avail; party desiring to communicate address "C. F. W.," office of *The Iron Age*, 96-102 Reade St., N. Y.

**FOUNDRIY FOREMAN** wants situation; American, age 40, well up in the business and up to date in the production of perfect castings at lowest cost; best of references. Address "PERFECT CASTINGS," office of *The Iron Age*, 96-102 Reade St., New York.

**A PARTY** of ability and long experience in Chicago jobbing hardware trade desires to arrange for Agencies that may be locally represented to solicit wholesale and manufacturing business; the lines desired are those of merit and in large demand or to represent exclusively a desirable line. Address "KESOR," care Orr & Lockett Hardware Co., Chicago.

**AS GAS PRODUCER MAN**; 20 years' experience at open hearth and heating furnaces, in rolling mills. Address **THOMAS MAHONEY**, 359 South St., Potstowen, Pa.

**AS BOOKKEEPER and CORRESPONDENT, CASHIER or TRAVELING SALESMAN.**—Married man, age 30, various responsible position; ten years' experience in office, six years traveling through the United States, Canada and Great Britain; acquainted with stove and hardware trades, also tin, brass and copper sheet metal manufacturing; fully competent to take entire charge of a manufacturer's office, or that of large wholesale or retail dealer; locality no object, will settle anywhere; seven years present position; A1 references; moderate salary. **WM. A. LANGFORD**, Lawrence, Mass.

**COMPETENT PARTY** experienced in designing, calculating cost, strength, power, in superintending construction of steam, hydraulic and other machinery, of iron and steel plants and machinery and structural iron work, familiar with best shop and office practice, wishes responsible position; moderate terms. Address "RELIABLE," No. 920, office of *The Iron Age*, 96-102 Reade St., N. Y.

**A GENTLEMAN** with a wide experience of the hardware business, close buyer and an active and successful salesman and hard worker, wants a position either as buyer, manager or salesman; could make himself very valuable to some good house; has a little money and would buy a small interest. Address "M.," No. 920, office of *The Iron Age*, 96-102 Reade St., New York.

**GRADUATE MECHANICAL ENGINEER** and draftsman, junior member American Society Mechanical Engineers, is open to engagement; experience in rolling mill, mining and general machinery; references. Address "W. T. L.," No. 920, office of *The Iron Age*, 96-102 Reade St., New York.

**AS SUPERINTENDENT** of file works, by practical man; posted in all improvements in the manufacture of files, had 13 years' experience with largest manufacturer in the world or would meet parties with capital to start in the manufacture of files. Address "SUPERINTENDENT," office of *The Iron Age*, 220 So. 4th St., Philadelphia.

**EASTERN MANUFACTURERS** in the hardware branch wishing to have some specialties placed before the trade in one or two of the Scandinavian countries, address "C. P. H.," office of *The Iron Age*, 59 Dearborn St., Chicago. Advertiser intends going to Europe in January, '95, and being a number of years engaged in the hardware line there is acquainted with several ironmongers using considerable American goods; only high grade goods with lowest prices will stand show for trade, as they will have to compete with large importing firms in Hamburg and Copenhagen.

**A MAN** of large experience in the hardware and cutlery business will be at liberty Sept. 1st. to make an engagement with a view to permanency; is well acquainted with Western trade and can in good times influence a large volume of it, or would accept an engagement east of Chicago in any good field, representing general trader specialties; references first-class in every particular. Address "WESTERN TRADE," office of *The Iron Age*, 96-102 Reade St., N. Y.

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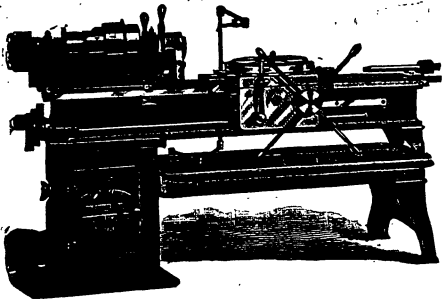
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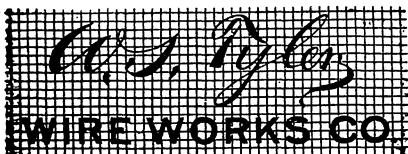
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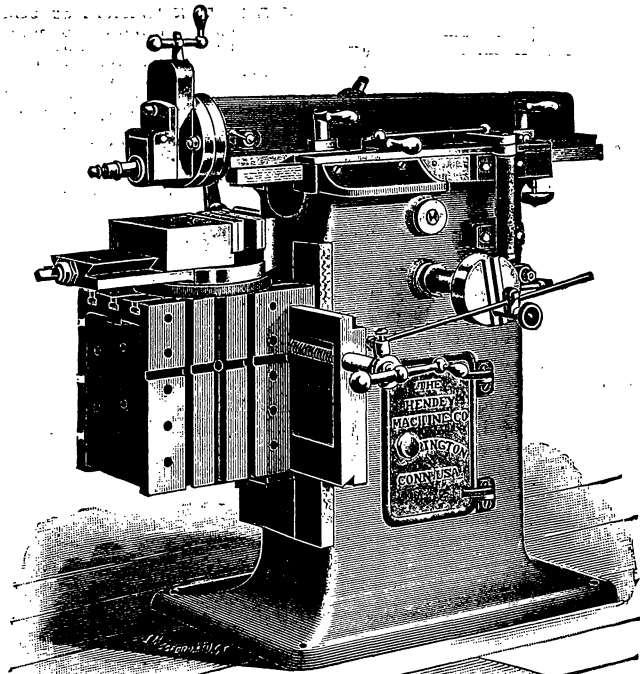
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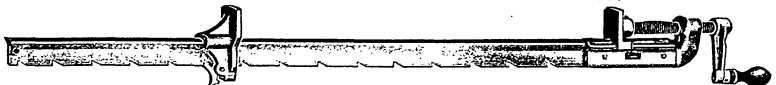
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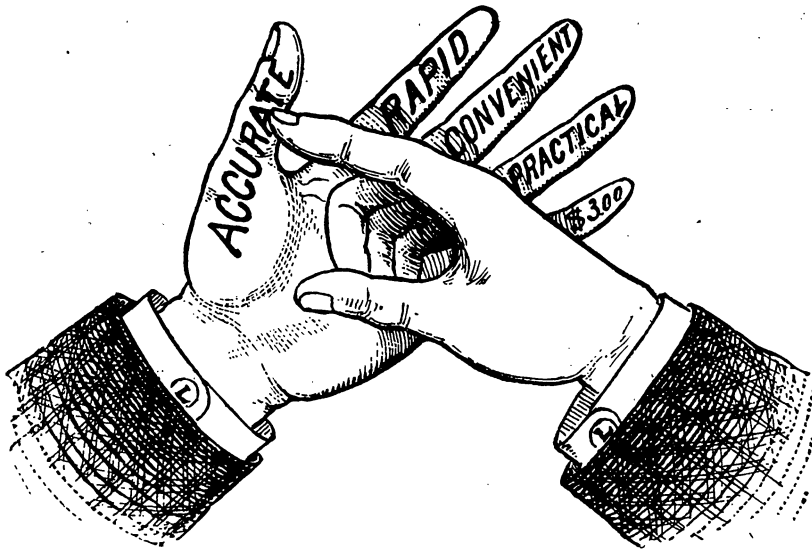
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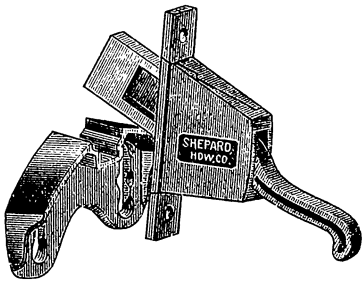
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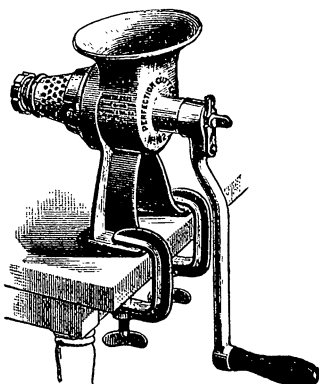
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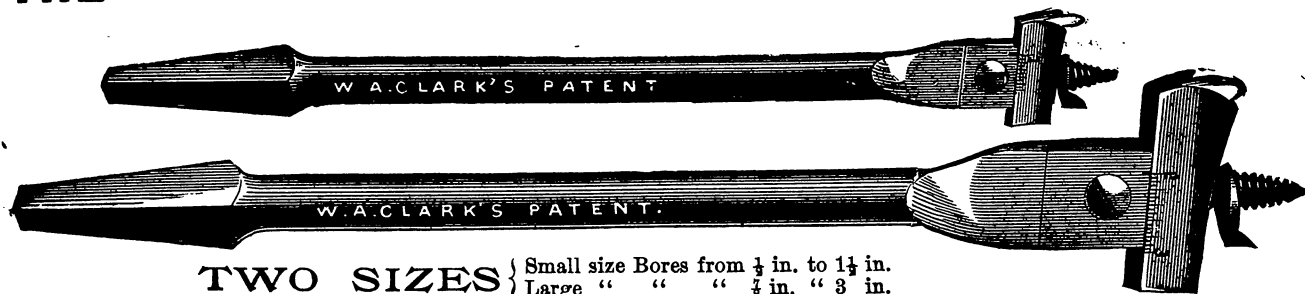
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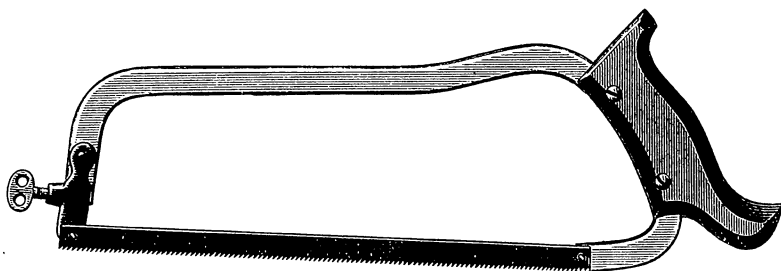
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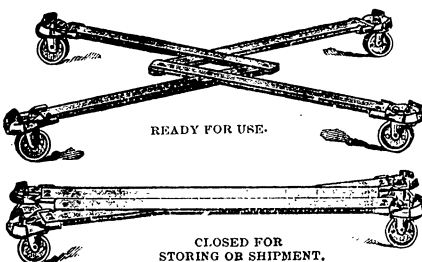
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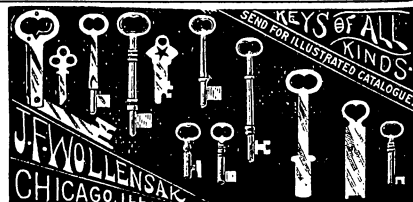
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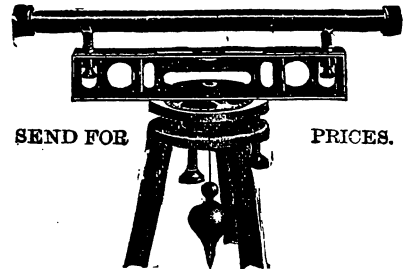
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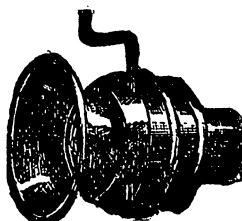


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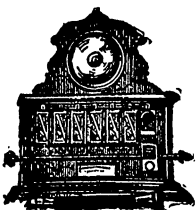


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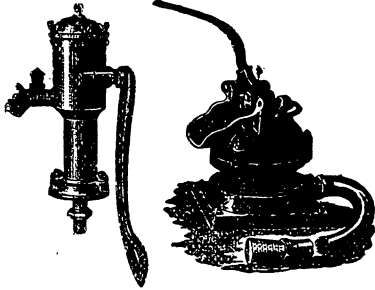
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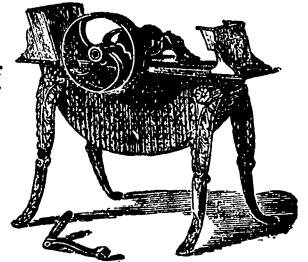
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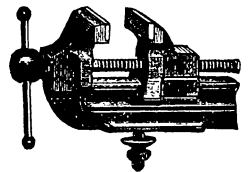
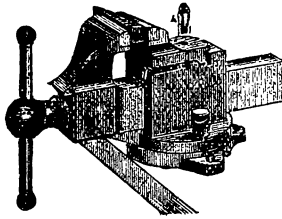
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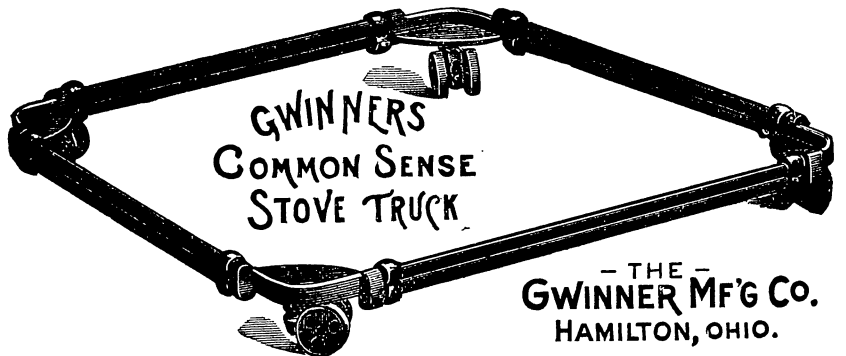
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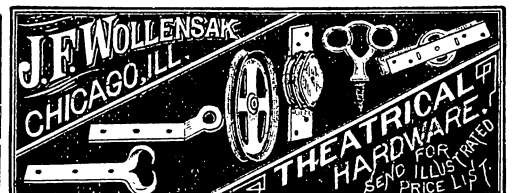
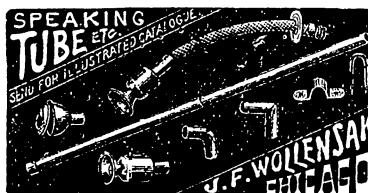
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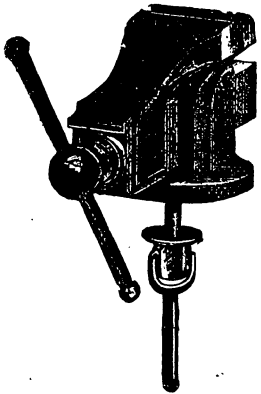
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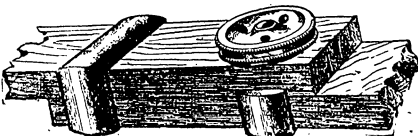
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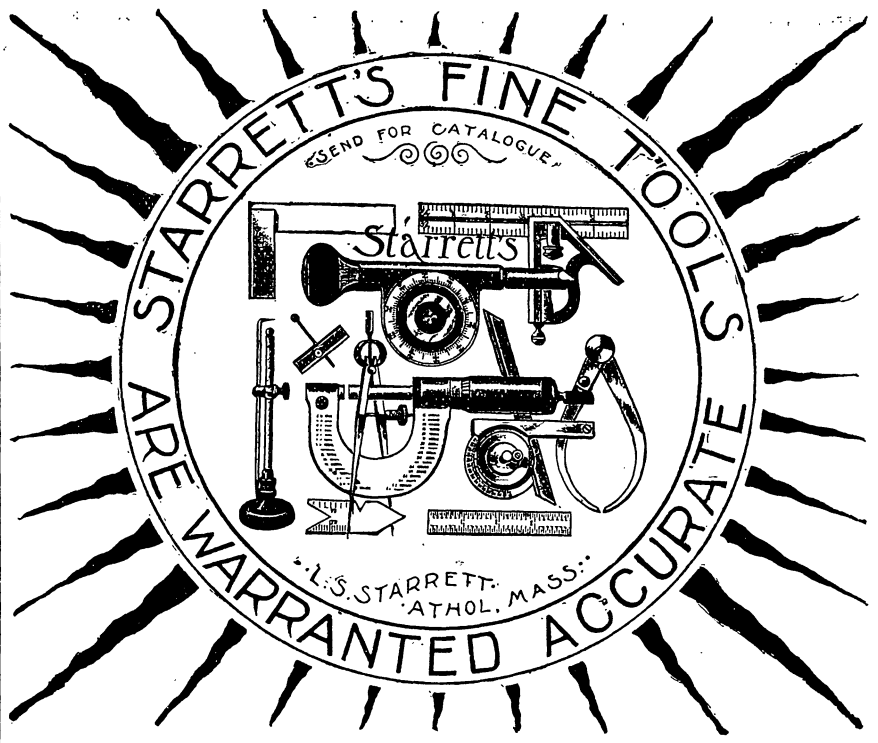
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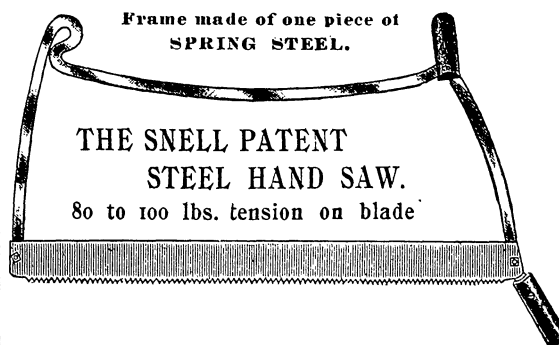
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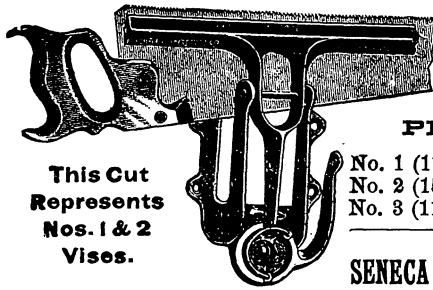
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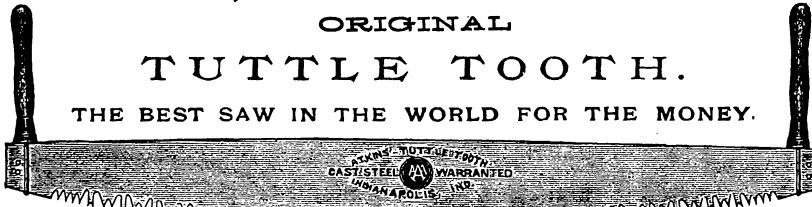
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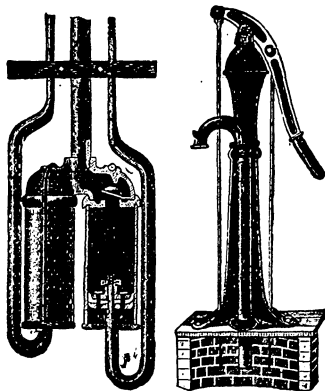
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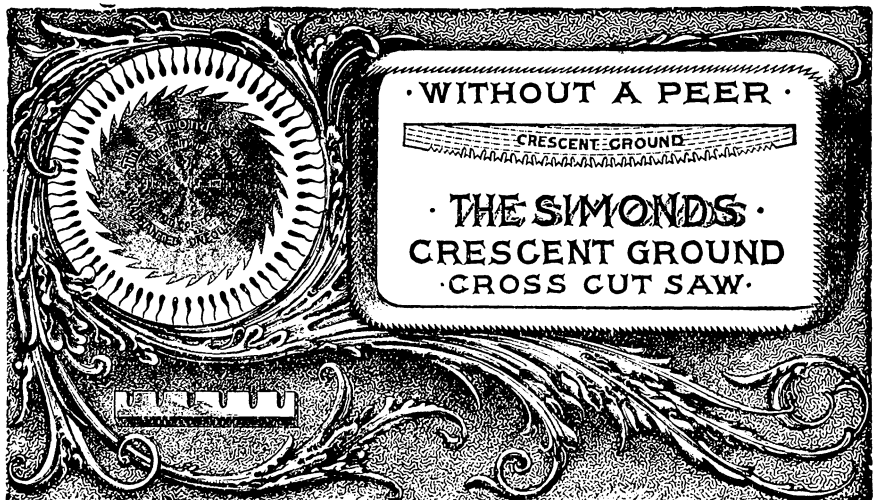
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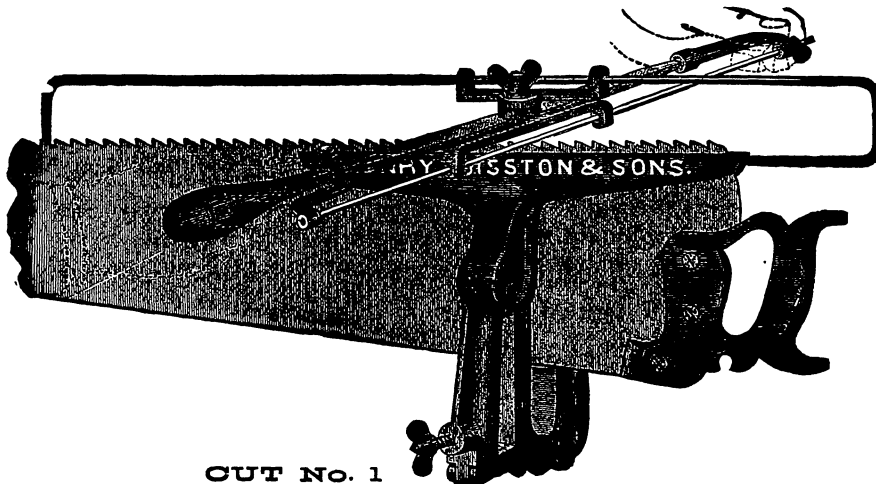
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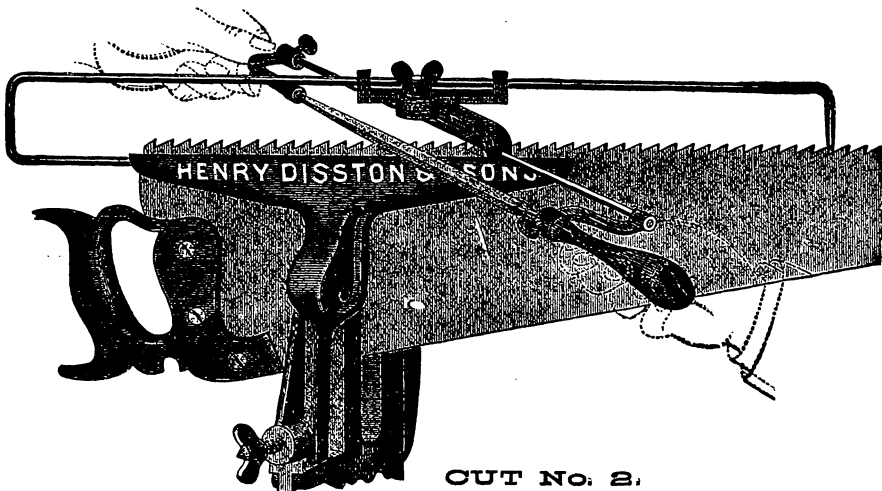
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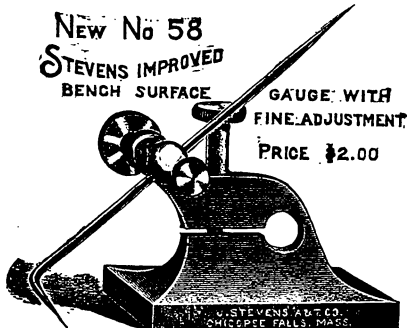
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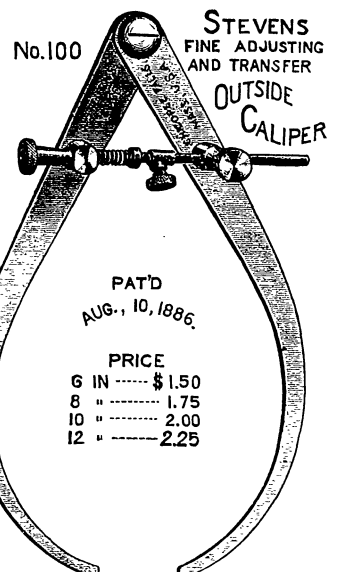
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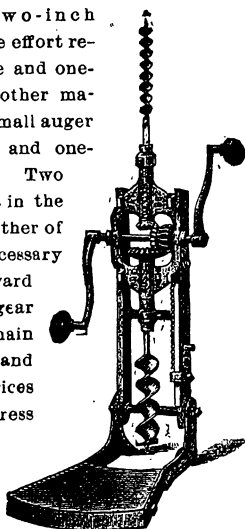
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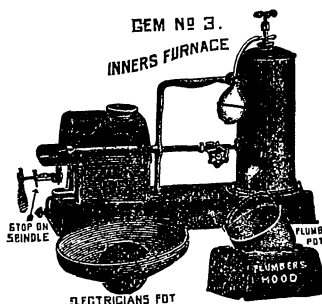
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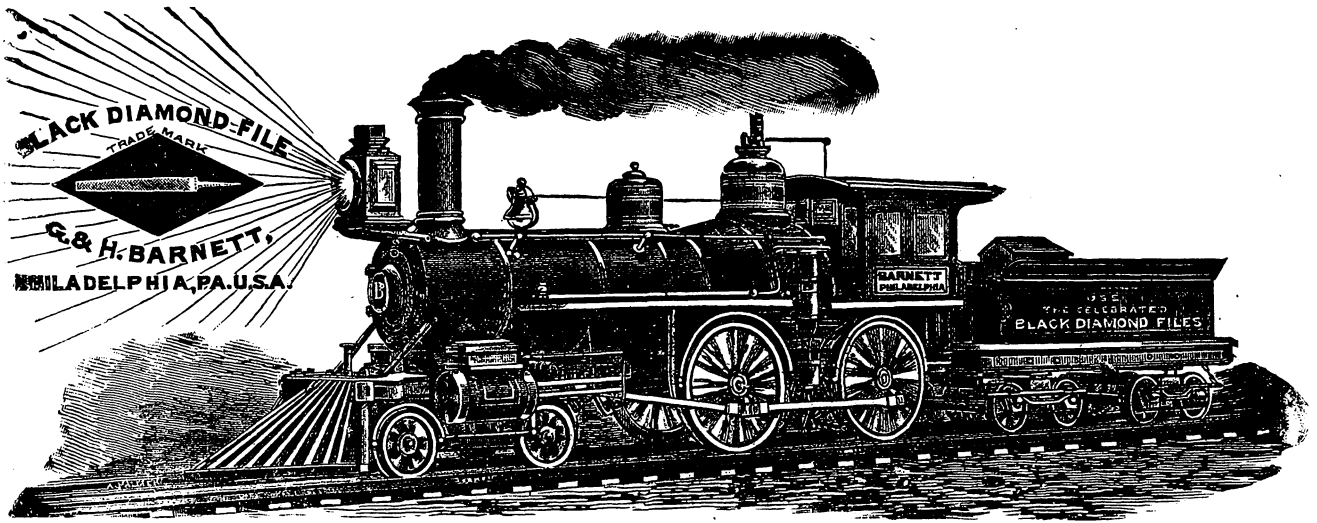
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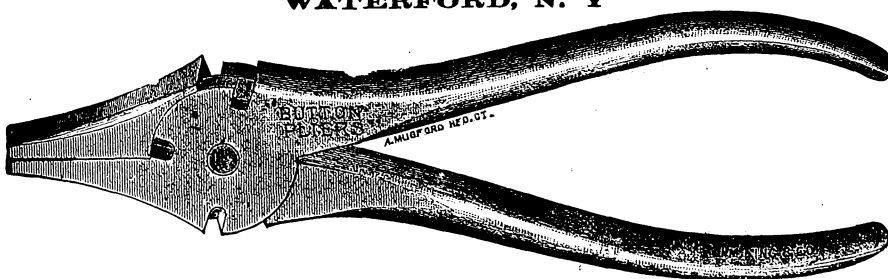
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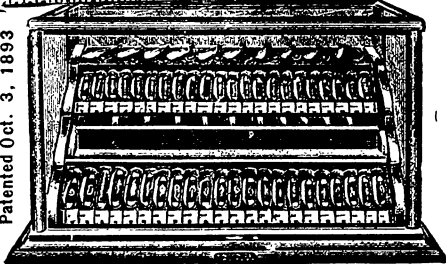
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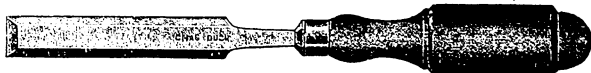


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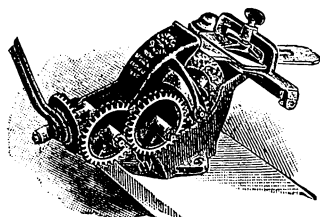
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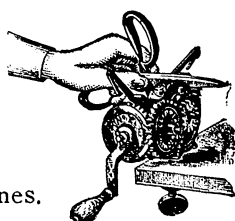
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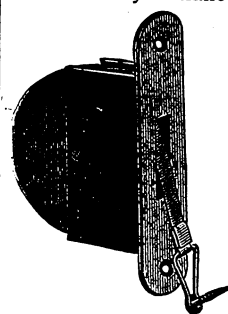
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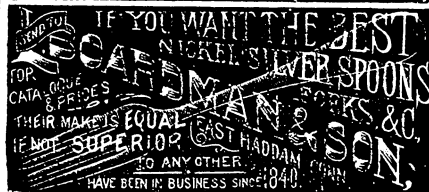
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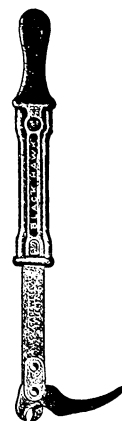
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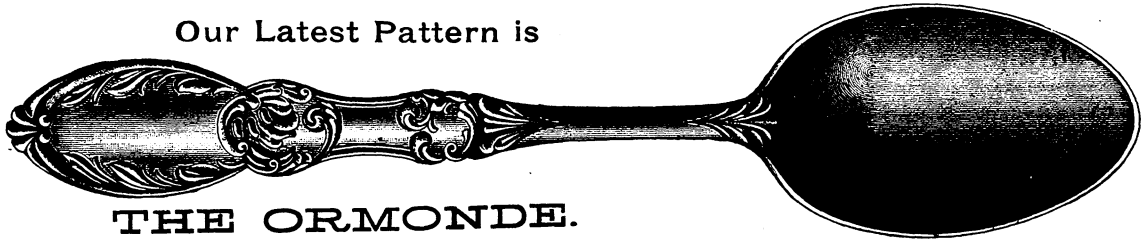
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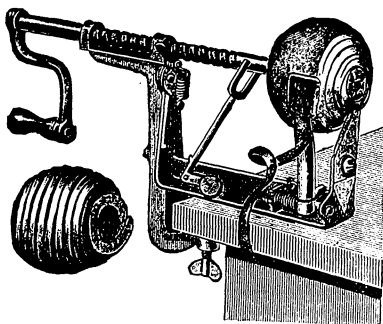
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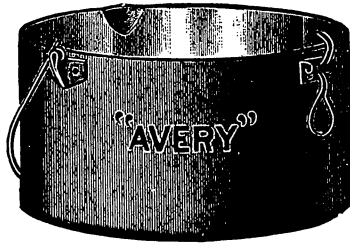
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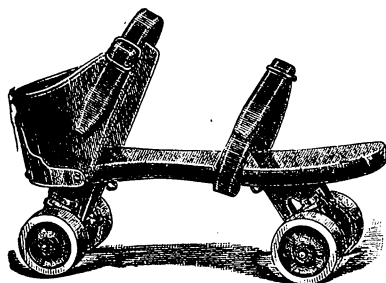
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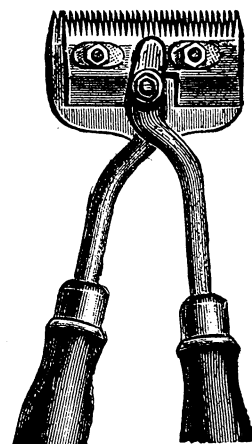
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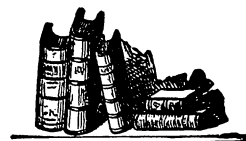
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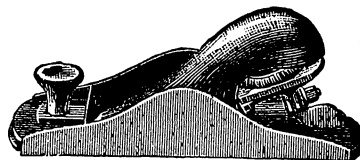
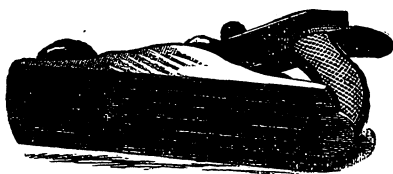
An address to the Institute of Accounts, New York, of which the writer is a member, put in form to assist those in charge of manufacturing accounts. Practical forms are included for a series of order books, examples of foreman's order, form of pay-roll, quarter-time book, job time book, form of summary, charges book, summary of costs, material, labor, cash, expense, manufacturing and improvement acts, store-room, iron foundry, brass foundry. Sent post-paid on receipt of price, by

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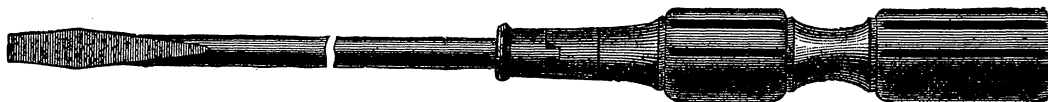
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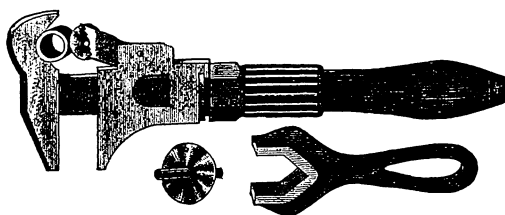


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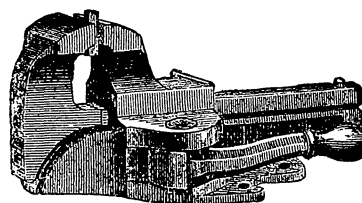


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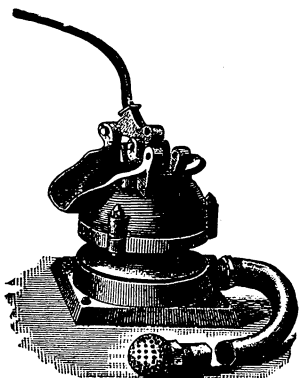
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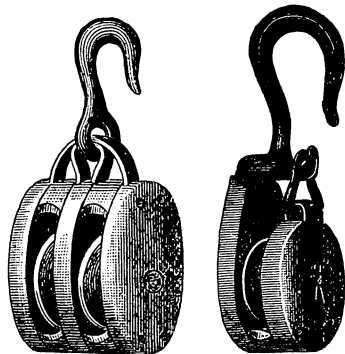
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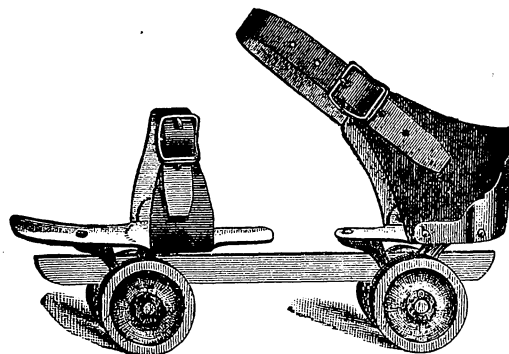
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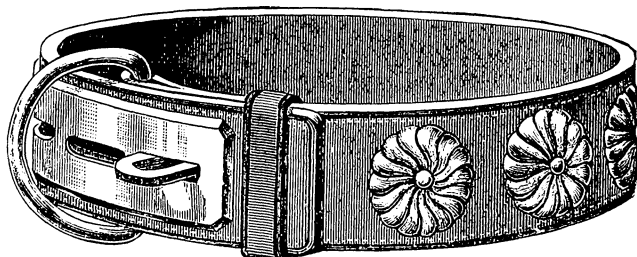
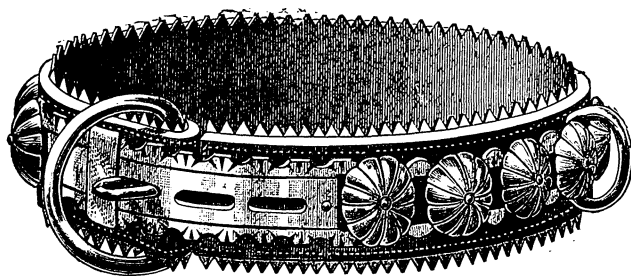
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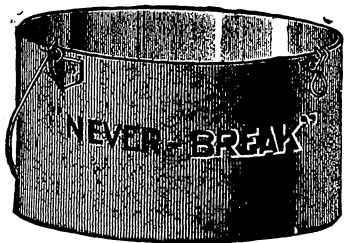
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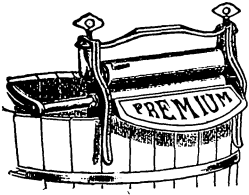
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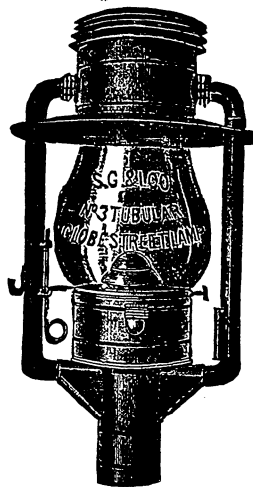
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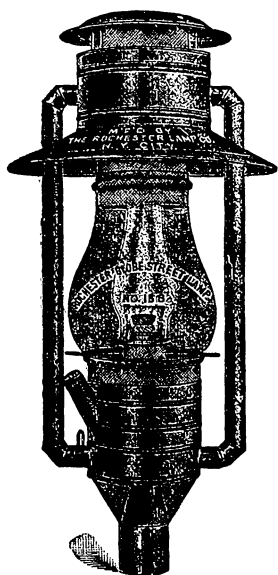
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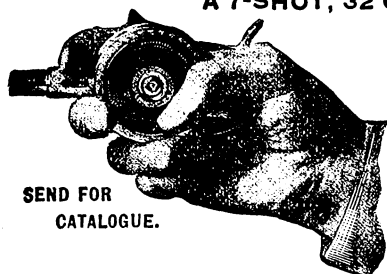


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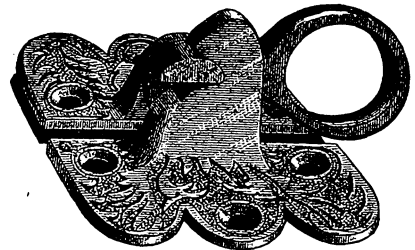


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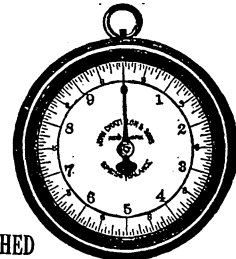
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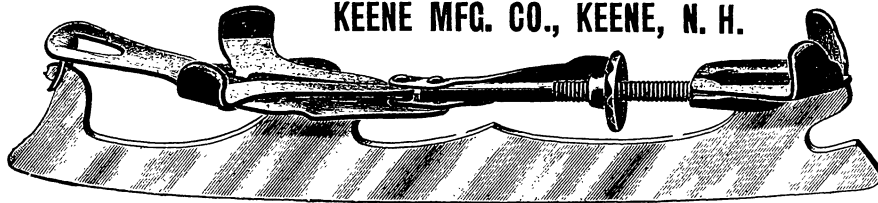


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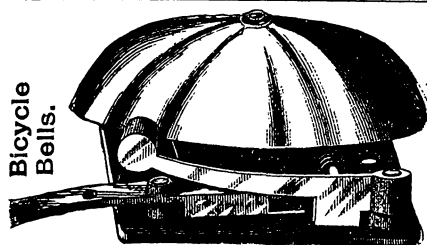
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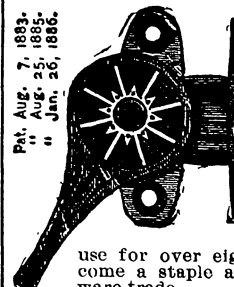
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SIDE  
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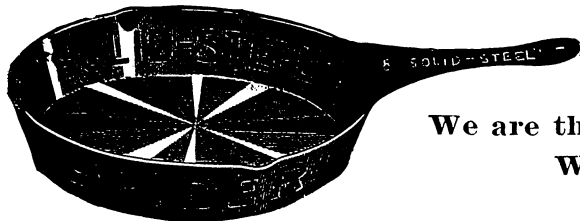
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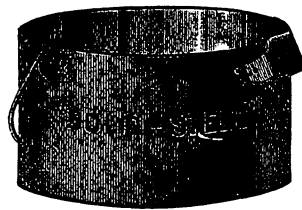
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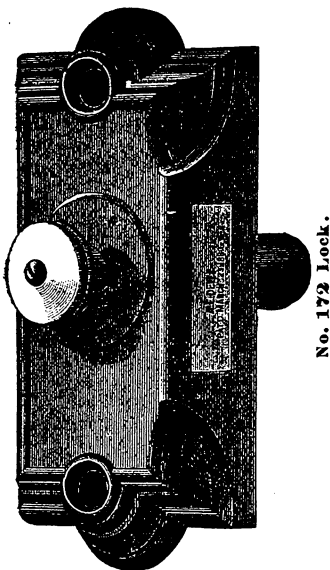


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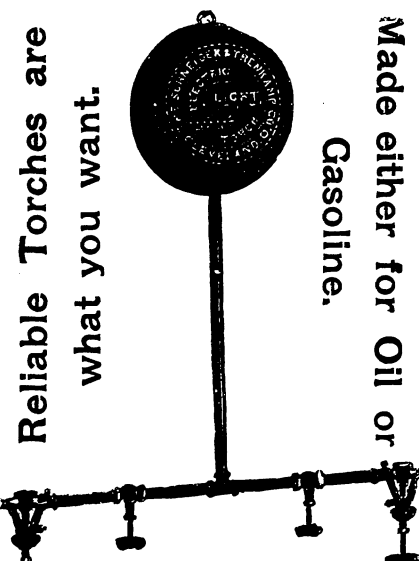
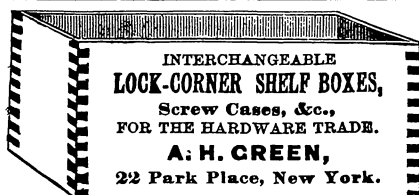
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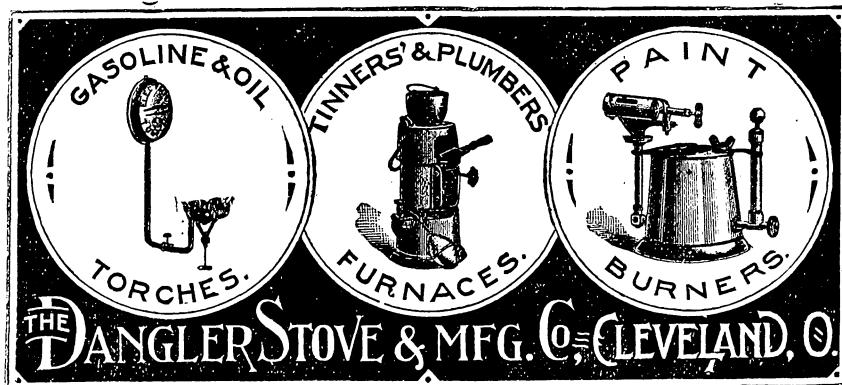
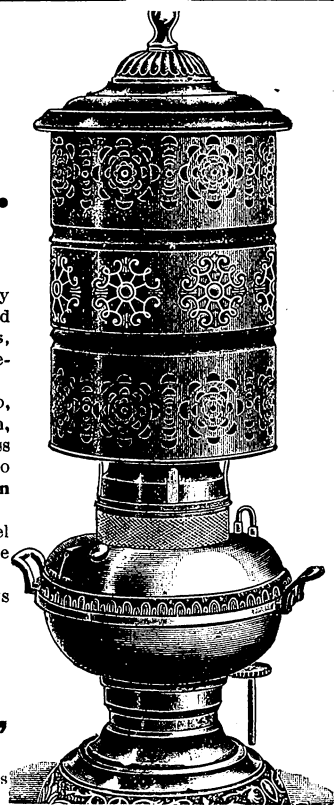
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One, Two, Three or Four Burners can

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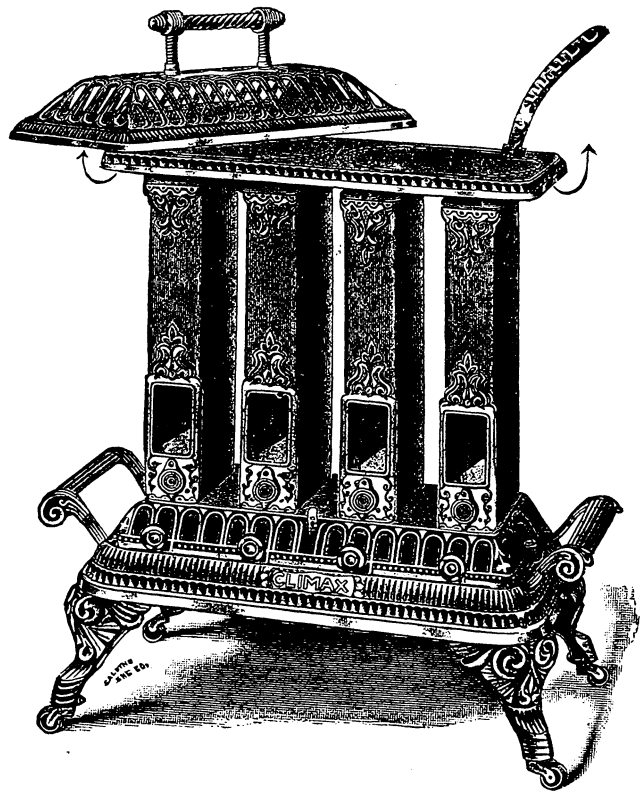
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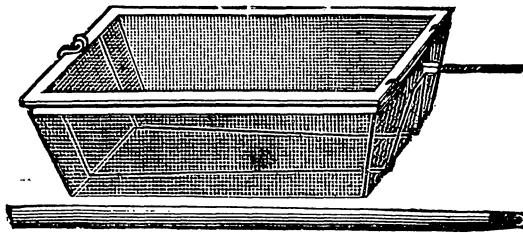
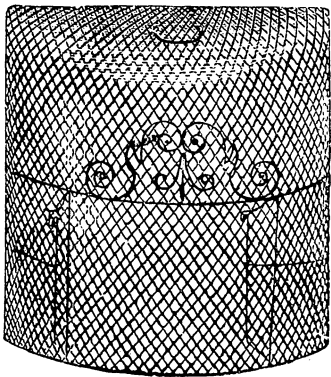
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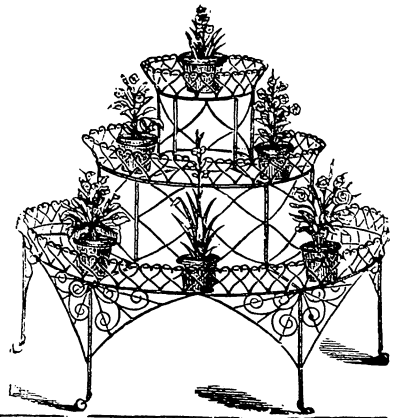
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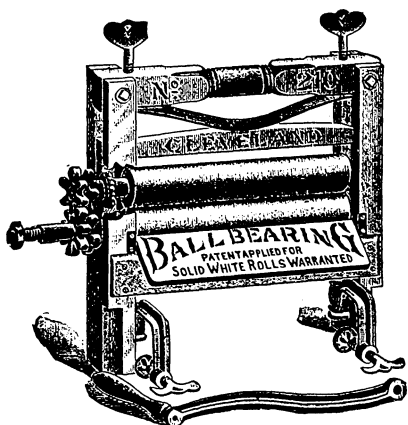
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**New Hot Air Gas Sad Irons, Soldering Irons, Cooking and Heating Stoves.**

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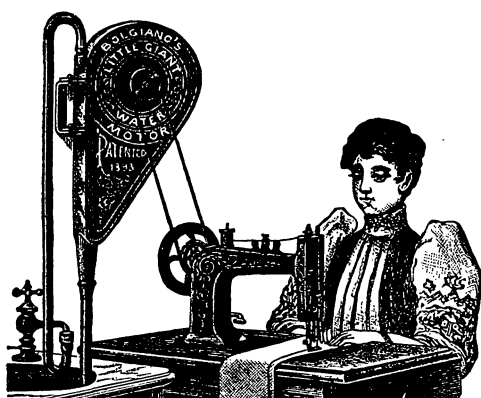


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**One-Minute Dish Washers, New Steam Clothes Washers, New Kitchen Smell Killer.**

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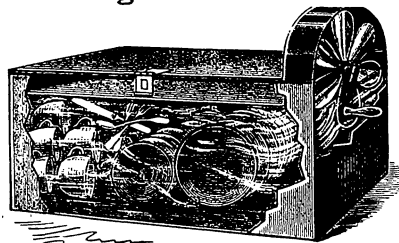
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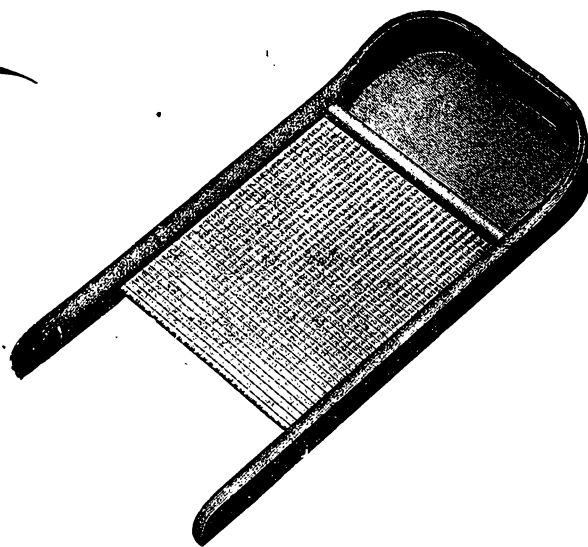
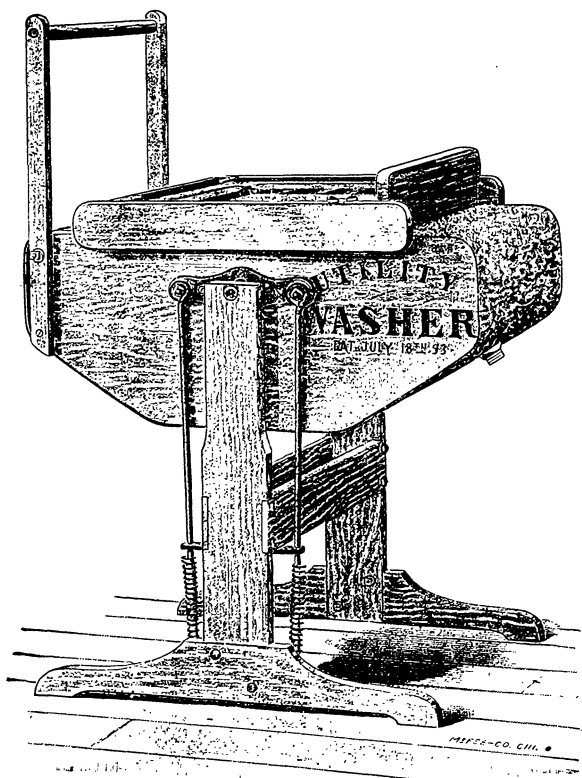
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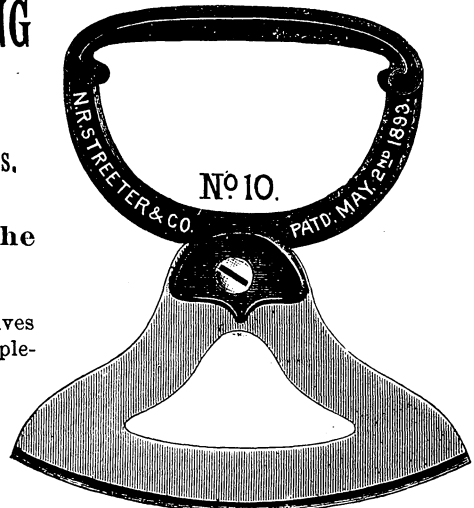
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Multiple-Bladed Means Rapid Cutting.

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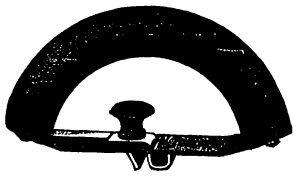
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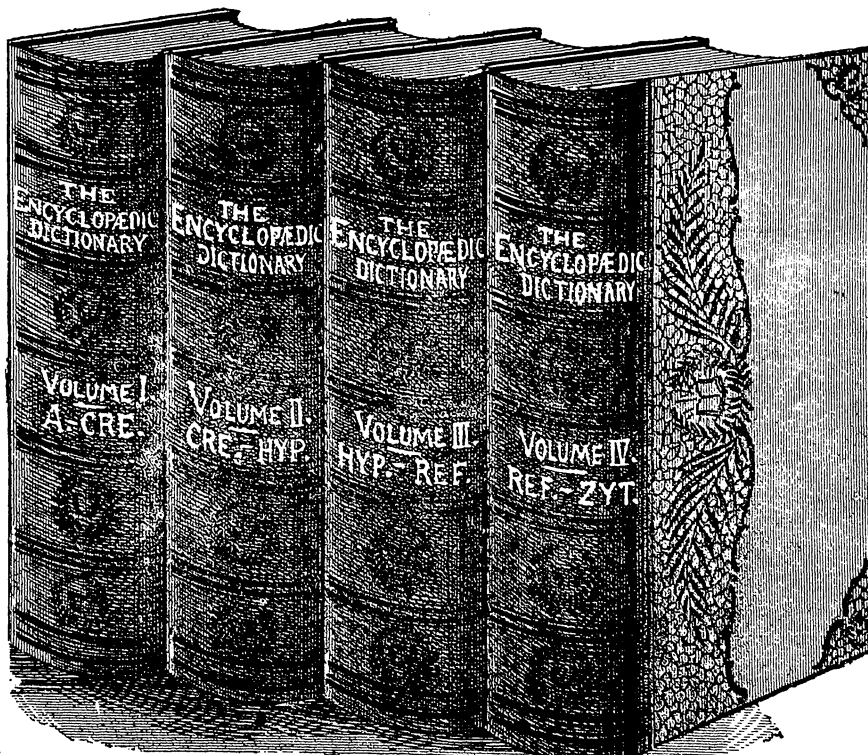
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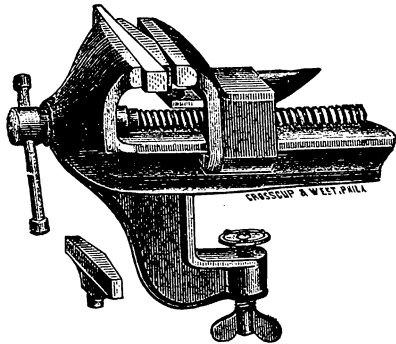
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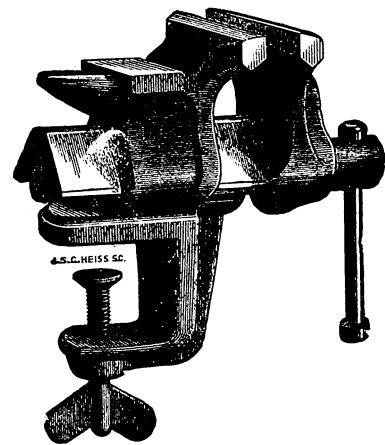
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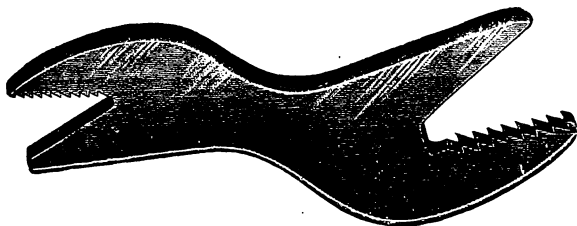
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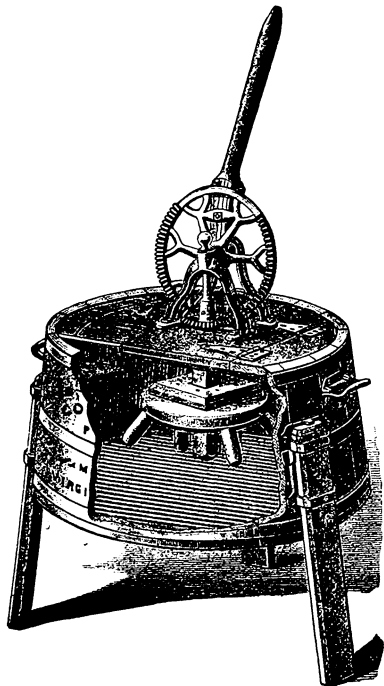
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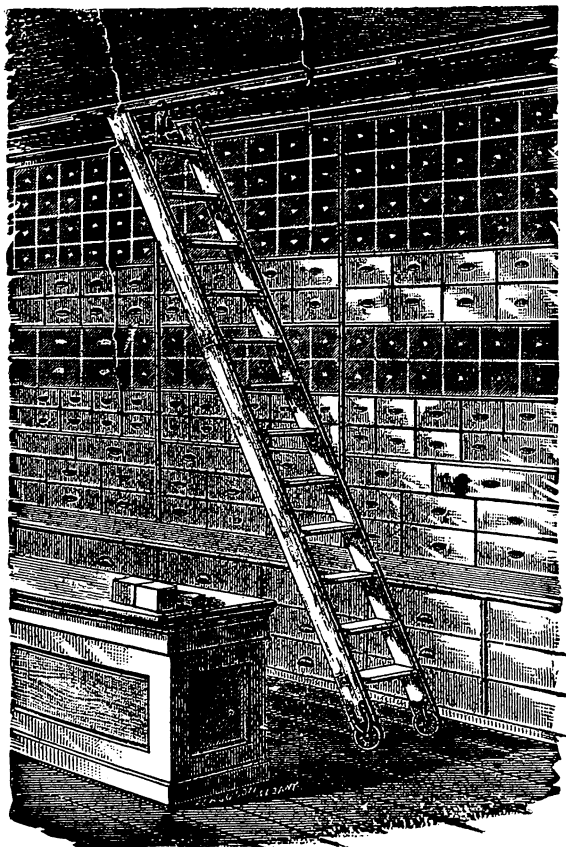


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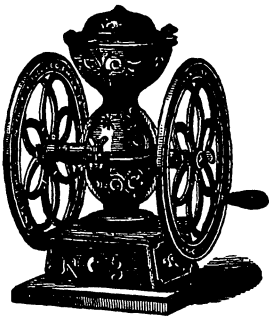
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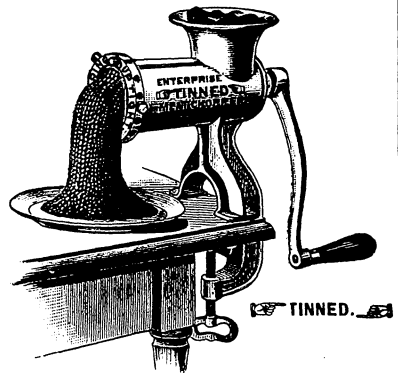
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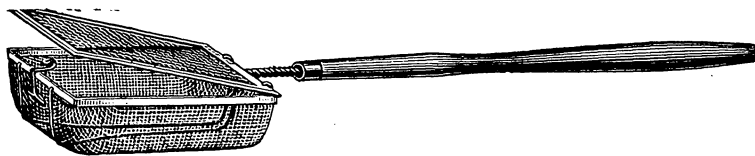
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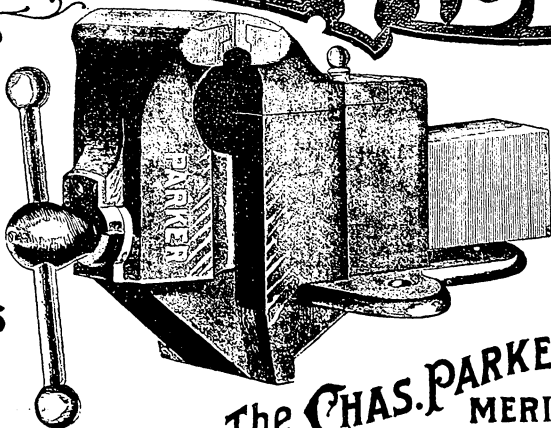
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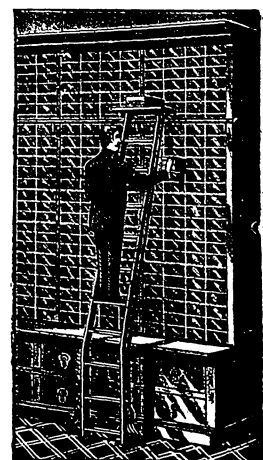


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Especially adapted for  
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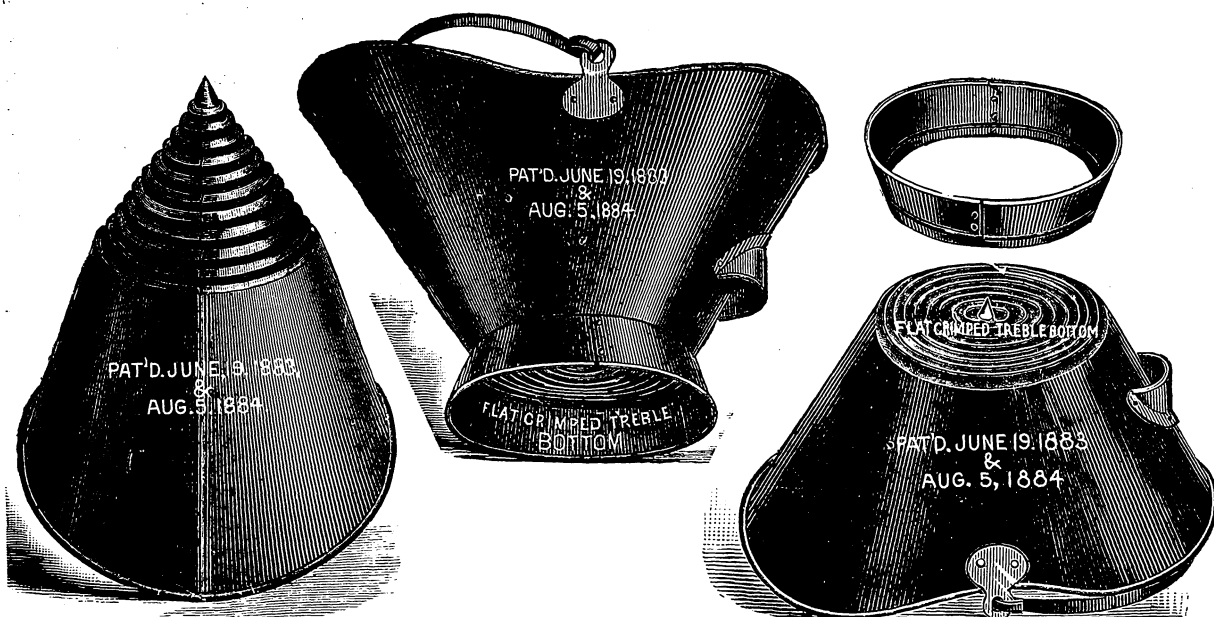
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## HIGHEST AWARDS WHEREVER EXHIBITED.

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 SECOND—Through our process of crimping, it has three thicknesses of metal in the bottom, where the strength is most needed.  
 THIRD—The Foot being compressed to the Hod between the body and bottom, it is impossible for it to come off as it does in most instances on other hods where the foot is riveted.  
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 FIFTH—It is the cleanest, for being made of one piece, and being water tight, will not allow the dirt and slush of the coal to soil floor and carpets.  
 SIXTH—It is cheaper, for it will wear fully ten times as long as any other hod made.

In fact, it is the best and cheapest the world has ever produced.

## READ WHAT THE TRADE SAYS!

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*Bucket Pump Co., Cincinnati, O.*

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Yours truly,

THE CINCINNATI TIN AND JAPAN CO.

CLEVELAND, O., Feb. 4, 1894.

*Bucket Pump Co., Cincinnati, O.*

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Yours truly,

THE MCINTOSH HUNTINGTON CO.,  
 per H. H. Bishop, Secretary.

SYRACUSE, N. Y., Feb. 3, 1894.

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GENTS—Your favor of 1st inst. at hand. In reply, we have been very successful in our sales of Crimped Bottomed Hods in the past. Owing to the heavy bottom they are very slow to rust out, where they always give out first.

We can recommend them highly to any one as being in our estimation the best hod made.

Yours truly,

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GENTLEMEN—We have sold the Corrugated Bottom Steel Coal Hod for many years and believe it to be the best hod in the market.

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For use in Mills, Foundries, Machine Shops, Paper and  
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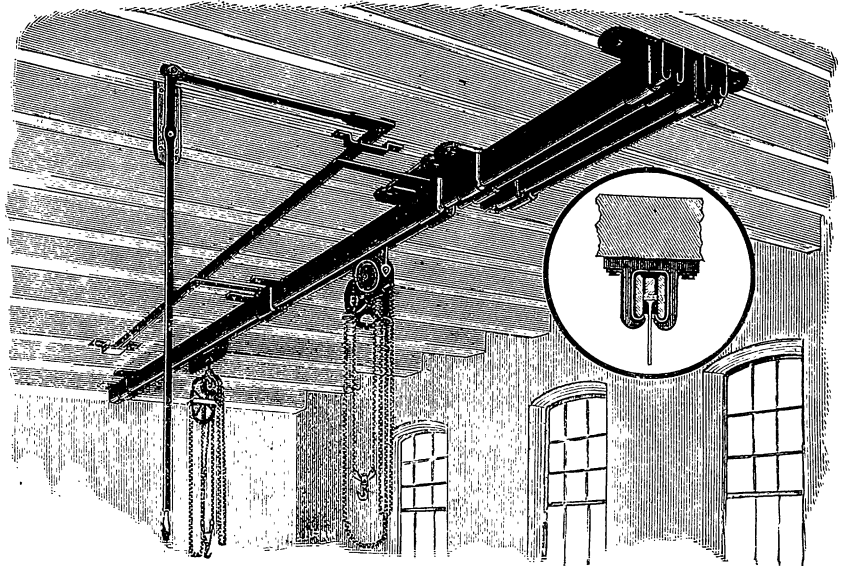
PARLOR  
BARN  
FIRE

Door Hangers

AND

A LINE  
OF

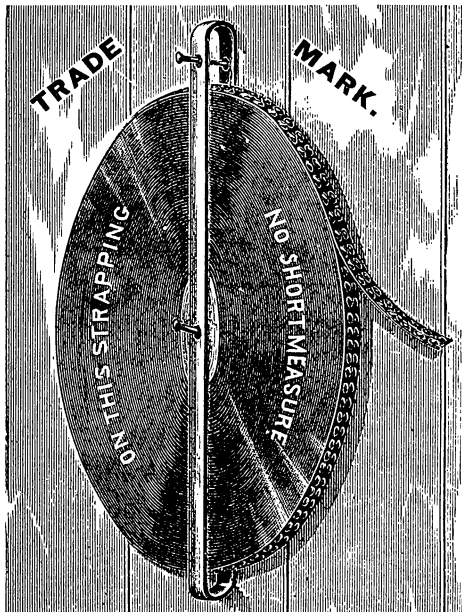
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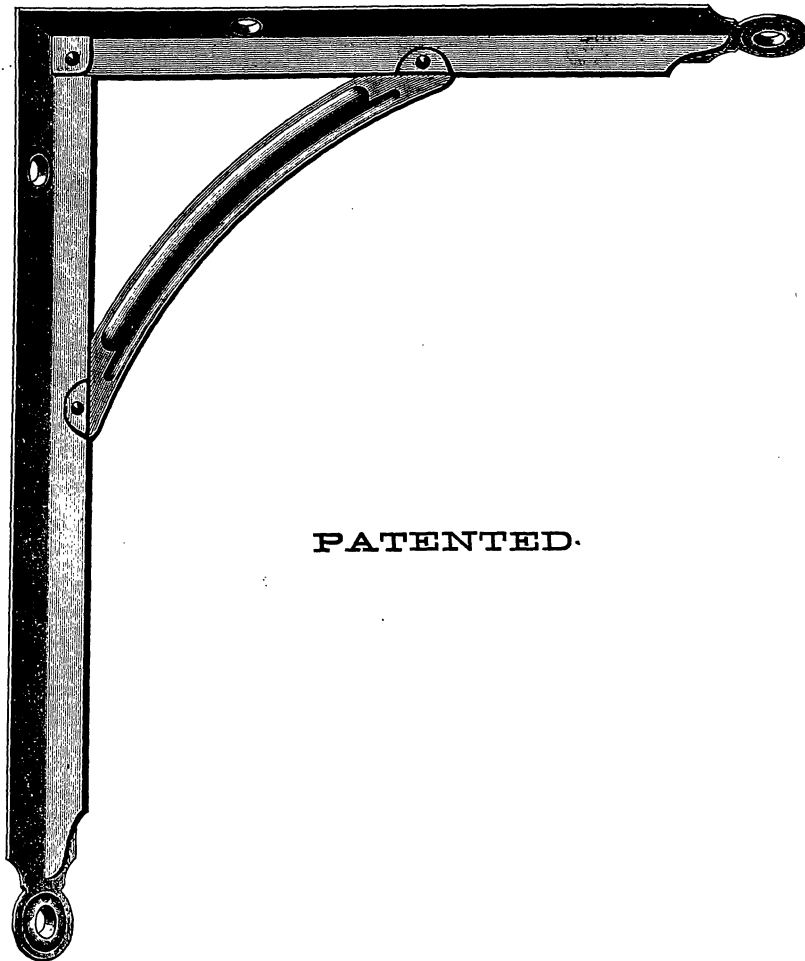


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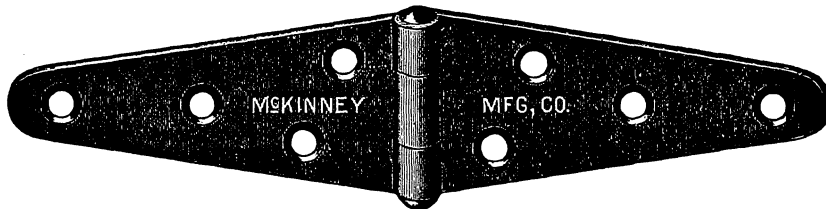
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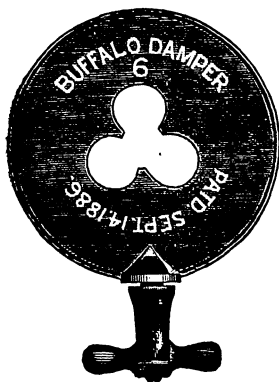
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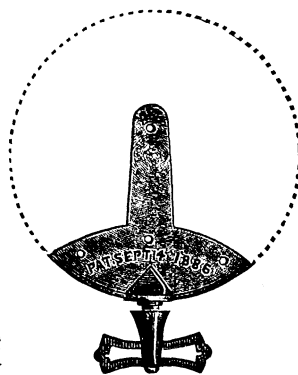
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ONLY ONE HOLE IN PIPE.  
NO SPRINGS.

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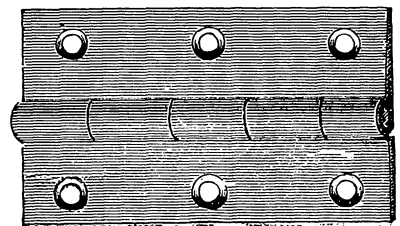
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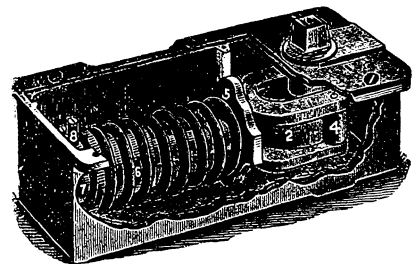
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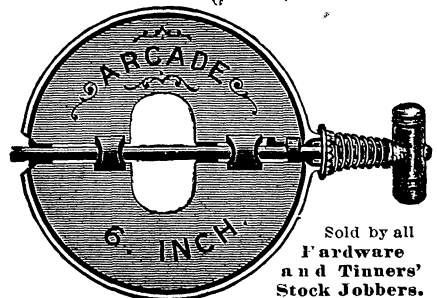
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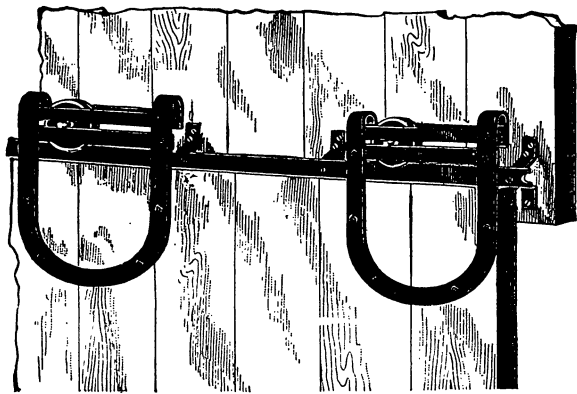
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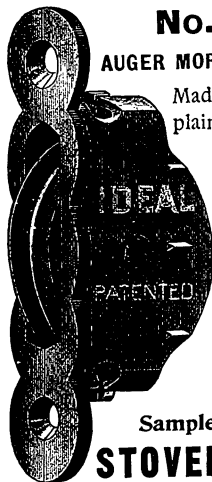
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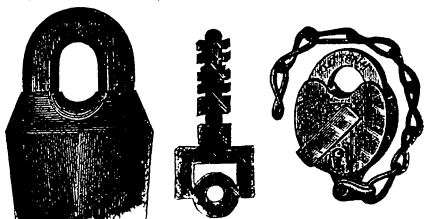
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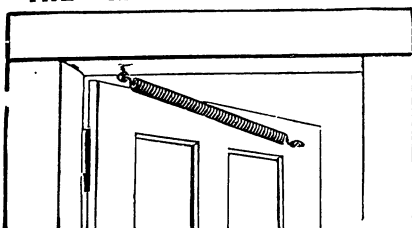
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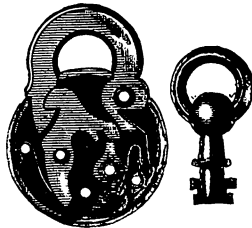
Best Screen Door Spring made. Send for our list of references, comprising some of the first houses in the land. They sell readily, and that is what you are looking for. Drop us a postal.

**COILED WIRE BELTING CO.,**

40 & 42 Noble St., Jersey City.

## PATENT PERFECTION PADLOCK.

*Eight Tumblers, Key Turning Both Ways.*



Sizes,  $\frac{1}{4}$  inch to  $2\frac{1}{4}$  inches, of cast bronze. Defies competition for quality and price. No steel or iron used, cannot rust, and cannot be picked. Also,  $\frac{1}{2}$  and  $\frac{3}{4}$  inch Padlocks, opened with a common pin, in brass and nickel, for cats and small dogs. The best Railroad Switch and Car Lock in the world.

Adopted by the United States Treasury for bonded warehouses.

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Send for Price-Lists and Circulars.

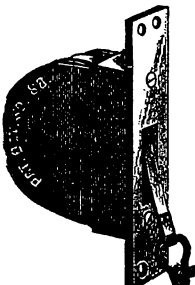
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To buy an inferior article, which your trade condemns, when you can get

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The best material, right principle and care in making and testing have made it the **LEADER** for five years. Write to

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**W. & L. WOLF,**

MANUFACTURERS OF

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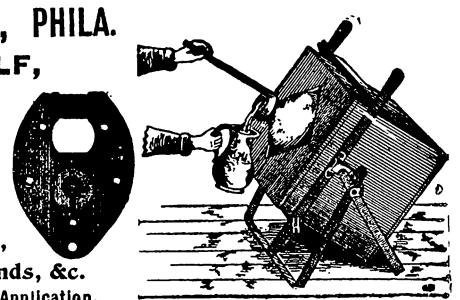
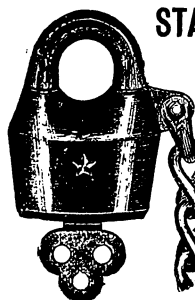
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Spring Padlocks,

Trunk & Case Locks,

Carboy Stands, &c.

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## TACKLE BLOCKS

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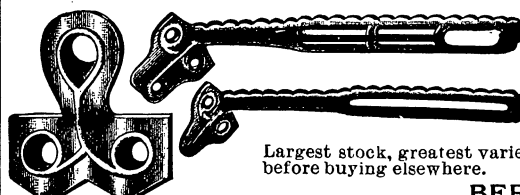
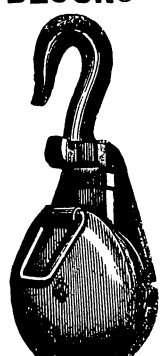
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**ARE BETTER IN EVERY WAY.**

No waste material. Every ounce of weight in the line of strength. No clumsy outside straps or bolts. As light as wooden blocks and vastly more durable. They wear, but never break. Sheaves interchangeable.

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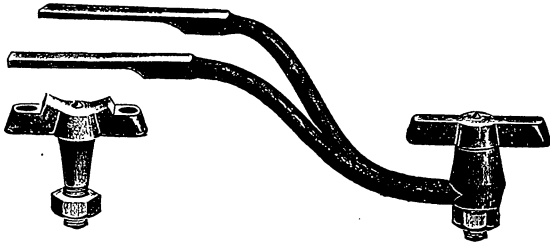


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**TINNERS' HARDWARE &  
ROOFERS' SUPPLIES.**

Largest stock, greatest variety. Prices lower than ever. Write us before buying elsewhere.

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 —MANUFACTURER OF—  
**CARRIAGE FORGINGS,**  
 Couplings, Clips, King Bolts, Fifth Wheels, &c.  
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Showing a full line of Axle Clips, Spring Bar Clips, Three Piece Saddle Clips and King Bolt Yokes and Braces.

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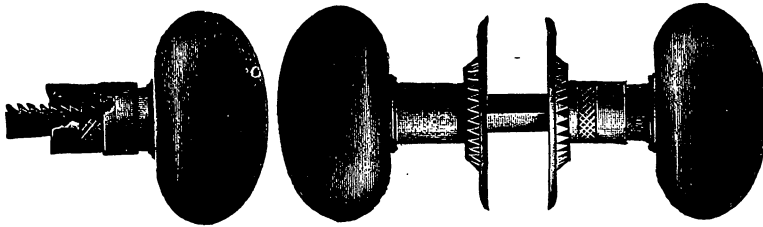
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Manufacturers,

Office: 813 Masonic Temple, CHICAGO.

WORKS AT MAYWOOD, ILL.

Sectional cut showing construction of Knob.



Half size cut of knob as applied to door. NO SIDE SCREWS OR ADJUSTING WASHERS.

Don't you want your stock to represent the latest and most improved up to date Hardware? The Whipple Patent Door Knob is the latest and best Door Knob attachment ever made. Give it a trial. **PERRY & WHIPPLE CO.,** New Haven, Conn. New York Sales Agent, E. G. SHEPARD, 142 Chambers Street.

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**Business Manual.**

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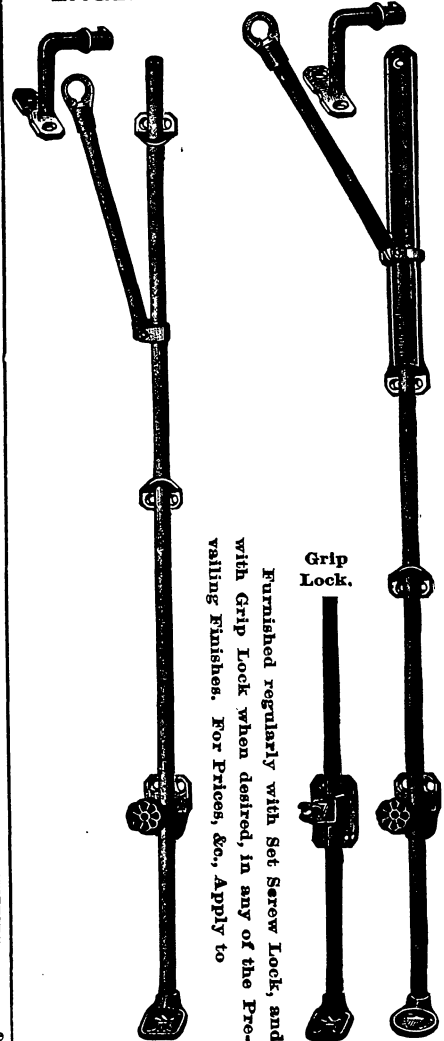
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"EAGLE."

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Furnished regularly with Set Screw Lock, and with Grip Lock when desired, in any of the prevailing finishes. For Prices, &c., Apply to

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**Cylinder**  
**Locks**

Are specified by Architects on first-class work everywhere. They are Safest and Best.

Manufactured by

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**Hardware**  
**Company,**

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**Factories, Reading, Pa.**

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SHOENBERGER & CO., PITTSBURGH, PA.,

After numerous and costly experiments have succeeded in manufacturing a special quality of soft homogeneous steel, specially adapted to the manufacture of Horse and Mule Shoes, and are now making from this steel Extra Swaged and Government Pattern Horse and Mule Shoes. They give the best of satisfaction everywhere and we furnish them to the trade at the same prices as the regular iron shoe sold by ourselves and our competitors. We are at present making our Roadster Pattern Horse Shoes out of Iron, but we will make them of Steel also within a short time.



## Juniata Steel Toe Calks.

We would also call your attention to our improved Steel Toe Calk, equal to any in the market. To secure the best wearing qualities, use sand or borax in welding on the Calk and cool off at a dark, or still better, cool off without plunging in water.

No. 1, 2, 3, 4, 5 and 6. Packed in 25 lbs.

Soft Steel Horse Shoe Bar, All Sizes.

### No. 2 EXTRA SWAGED FRONT.

The advantages of these shoes are that, being made of vastly superior material, they will never show signs of red-shortness or cold shortness, will never split in the crease and will always show a much finer finish than any iron shoe.

We make the Steel Shoes lighter than the Iron, giving more shoes to the keg, as follows :

No. 1, 15 more shoes to the keg.

No. 3 10 more shoes to the keg.

" 2, 14 "

" "

" "

" "

" "

" "

" "

" "

And other sizes in proportion.

We also beg to say that we have introduced improved machinery into our new factory and have doubled our capacity, and are now prepared to furnish the best shoe, either iron or steel, ever offered to the trade.

Write to us for information and prices, or apply to jobbers and dealers, who sell them everywhere.

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JUNIATA IRON AND STEEL WORKS, - - - PITTSBURGH, PA.

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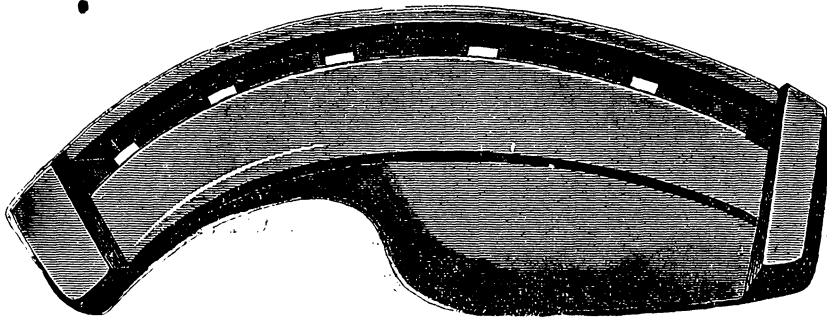
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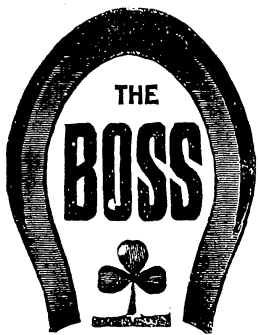
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Made under Deeble's Patent, Aug. 9, 1887.

Our 1891 pattern is a modification of the style we have made for the past four years, giving additional strength to the web.

IT IS JUST RIGHT.



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Superior Quality, Shape and Finish.

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JUST TRY THEM and YOU will say they excel all others.

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Other "high grade" specialties in Rivets, Spikes, Splice Bars, Track and Machine Bolts, Blanks, Nuts, Stay Bolt Iron, Horse Shoe Iron, Bar Iron, &amp;c.

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Elegant Iron.

Beautiful Shape.

HORSE SHOES,

Light, Medium and Heavy.

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Made from best quality of Scrap Iron and old Horse Shoes.

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# Capewell Horse Nails.

HIGHEST AWARD.

GOLD MEDAL.

Office, Manufacturers' Building, Midwinter Fair.

SAN FRANCISCO, CAL., July 1st, 1894.

THE CAPEWELL HORSE NAIL CO., Hartford, Conn.

Gentlemen:—The official list of awards of the American Exhibitors has been handed to me to-day by the Director-General, and I am pleased to notify you officially that your exhibit received the First Award, which is a gold medal. Yours respectfully,

EDWARD SCOTT, U. S. Commissioner.

At Centennial Exposition **HIGHEST AWARD** At World's Columbian Exposition  
AT PHILADELPHIA. AT CHICAGO.

TO THE

**PUTNAM**

HOT-FORGED AND HAMMER-POINTED

**HORSESHOE NAILS.**



REGULAR HEADS for ordinary creased shoes.  
CITY HEADS, or short heads for shallow creased shoes.  
COUNTER HEADS for "Goodenough" shoes.  
FRENCH HEADS for punched shoes, without creases.



These Nails are drawn from head to point from the BEST SWEDISH IRON RODS at a welding heat, thus:  by percussive hammer blows only; then polished by the water process, without the aid of acids, and hammer-pointed without any rolling or shearing.

They are the best because they are made of the best iron, and by the only process in which the iron is treated naturally, and its strength preserved.

Those who handle only the best goods hold the confidence of their customers.

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MANUFACTURE THE LARGEST VARIETY OF

# FORGED CARRIAGE IRONS

Of Best Material and Workmanship.

Send for Price and Illustrated List of

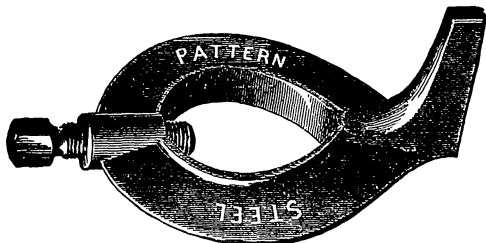
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Manufactured by the NATIONAL HORSE NAIL CO.,  
VERGENNES, VERMONT.

All Sizes. All Patterns. All Warranted. Sold Everywhere.

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WITH STEEL SCREWS.

U. S. Standard.			Points Hardened.		
No.	Inch.	Price.	No.	Inch.	Price.
1.....	¾.....	\$0 35	7.....	1¼.....	\$1 00
2.....	¾.....	35	8.....	2.....	1 10
3.....	¾.....	60	9.....	2½.....	1 40
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Small set of 8, \$5.50. Full set of 12, \$12

SEND FOR CATALOGUE OF FULL LINE OF MACHINISTS' TOOLS.

C. W. LE COUNT, MANUFACTURER, SO. NORWALK, CONN., U. S. A.

These goods are for sale by CHAS. CHURCHILL & CO., Ltd., 21 Cross St., London, England.



## Covert Pants Stretcher.

THE Covert "Pants Stretcher" will restore the pantaloons to their original shape and length. It removes all **WRINKLES and BAGGING AT THE KNEES**, giving them the appearance of having just left the tailor's hands.

It also holds the pants in a convenient position for brushing and cleaning.

The Stretcher cannot get out of order, and can be adjusted in the pants in a few seconds.

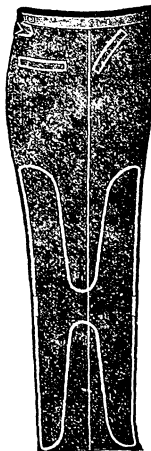
It being applied inside the pants, it obviates all objections prominent in other stretchers.

It is made of steel wire, and being in sections can be packed in a valise when traveling. Sold by the trade, or

Sample pair sent by mail to any address, free of postage, on receipt of \$1.00.

MANUFACTURED ONLY BY

COVERT MFG. CO., West Troy, N. Y.



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Successor to  
Manufacturer of  
PATENT STEEL  
(Blunt and Sharp)  
**TOE-CALKS.**  
—ALSO—  
BURKE'S IMPROVED  
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Send for Circulars.  
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BAR IRON.

CRESCENT HORSE SHOE  
IRON CO.

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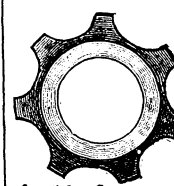
## FROST'S ANTI-RATTLE

Pat. Jan. 20, 1880.

Cut One-half Size.

Sample pair sent to any hardware or saddlery firm by ad dressing

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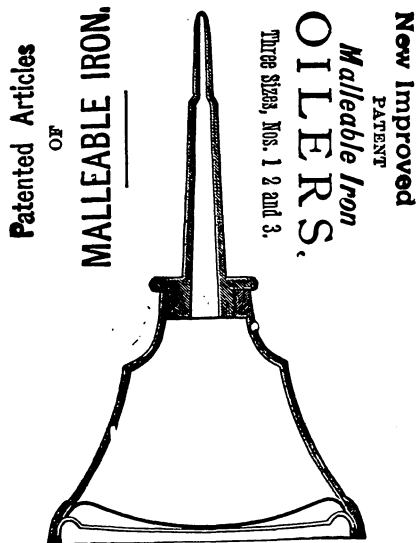
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**Hammer's** Adjustable Clamps.  
Mall. Iron Hand Lamps.  
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New Pattern Heavy Screw Clamps.  
*Strongest in the market.*

For Sale by all the Principal Hardware Dealers.  
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**MALLEABLE IRON CASTINGS**  
of superior quality, and Hardware Specialties  
in Malleable Iron, made to order.

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**HARDWARE DEALERS**

CAN RECOMMEND THE

**CHAMPION METAL WINDOW  
SASH CHAINS**

to their customers as a reliable substitute for  
Sash Cords, very strong and lasting (some in  
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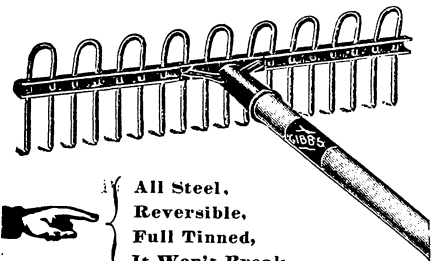
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I MAKE a specialty of  
**CAST IRON**  
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**WASHERS.**

ANY WEIGHT; ANY STYLE.

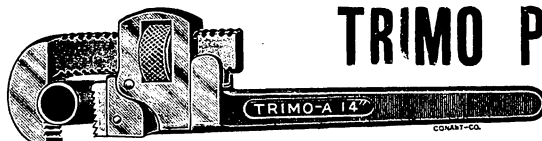
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Forged Steel.

All Parts Interchangeable.

Grips firmly without loss of motion. Releases readily. Never locks. Causes no  
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The chain holds securely ;  
cannot fall out even if used  
upside down. Readily releases  
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head. Fine quality of tool steel.  
In interchangeable gripping jaws.



**TRIMO COMBINATION WRENCH.**

**FOR NUTS**

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**HYDRAULIC FORGINGS**



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**Billings' Patent  
Adjustable 4-in. Pocket Wrench**

Drop Forged  
from Bar Steel.



Finished in  
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Sliding bar gradu-  
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an inch.

Adopted by the Pope Manufacturing Co., and pronounced by them the best  
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**THE BILLINGS & SPENCER CO.**

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Drop Forgings of Every Description.

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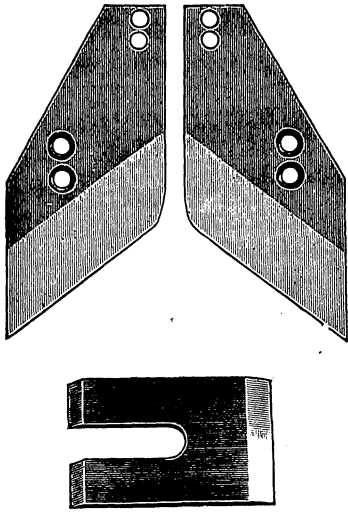
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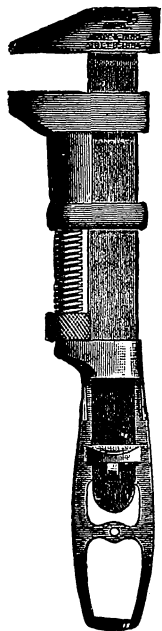
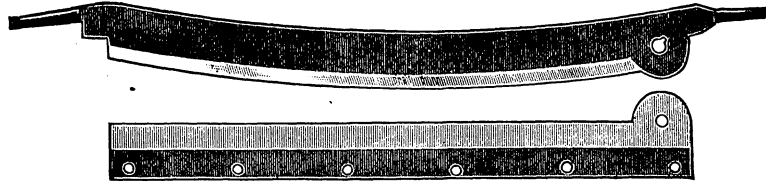


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## Manufacturers of MACHINE KNIVES.

Shear Blades and Strips, Moulding Cutter Plate, Die Stock for Leather, Cloth and Paper Cutting Dies. Lawn Mower and Hay Cutter Knives of every description.



## L. COES'

Genuine Improved  
KNIFE HANDLE  
PATENT

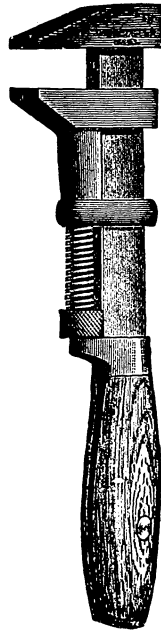
## Screw Wrenches

MANUFACTURED BY

COES WRENCH CO.,  
WORCESTER, MASS.

Established in  
1839.  
Registered  
March 31, 1874.

Patented July  
6, 1880.  
Patented July  
8, 1884.



Sectional View Illustrates our New Knife Handle, showing Malleable Iron Frame and Shank of Bar keyed into position.

6" Straight Bar, Extra Long Nut for Screw in Jaw.

The BEST MADE and STRONGEST WRENCH in the MARKET.

J. C. McCARTY & CO., } New York Agents.  
JOHN H. GRAHAM & CO., }

• IMPROVED MINE LAMP •  
FOR ANTHRACITE AND  
BITUMINOUS  
MINING.

6  
DIFFERENT  
STYLES  
OF SPOUTS.  
SAMPLE 15¢.

SEAMLESS  
BRASS  
COLLAR  
BRASS HINGE  
Lid Solid  
No Solder

B. E. LEONARD, Scranton, Pa.

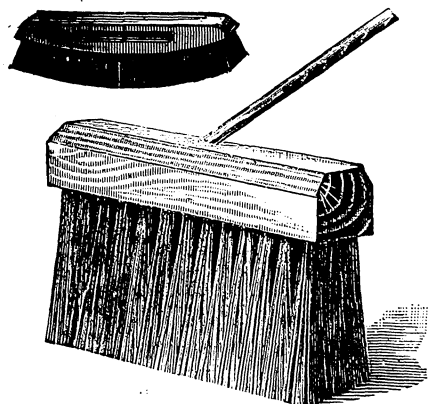
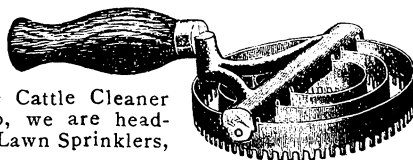
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Sells on sight. Clock spring blades. Best made and finest comb ever offered.

WE OWN THE BOTTOM PATENTS.

Write for circulars. Also of our Humane Cattle Cleaner and Shedder Mane Combs. Remember also, we are headquarters on Posthole Diggers, Lawn Rakes, Lawn Sprinklers, Etc.

F. E. KOHLER & CO., CANTON, OHIO.



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MANUFACTURERS OF

## Steel Wire Brooms,

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## MOULDERS' BRISTLE BRUSHES

Heavy and Light Shop Brooms, Push Brooms of every kind. Street Sweeper Rolls refilled.

CORRESPONDENCE SOLICITED.

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Trade-Mark.

Made in Hay,  
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Heavy and long  
Steel Socket. Most  
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The Iowa  
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Makers of

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ESTABLISHED IN 1848.

INCORPORATED IN 1877.

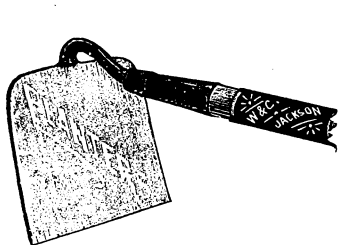
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JACKSON, MICHIGAN, U. S. A.,

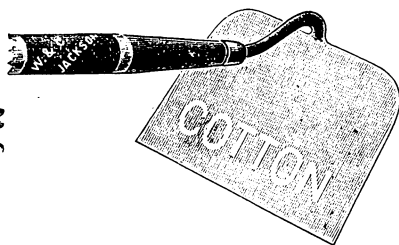
—MAKERS OF—

Forks, Hoes, Garden Rakes, Potato Hooks, Scythe  
Snaths, Grain Cradles, Handles, Wheelbarrows, &c.

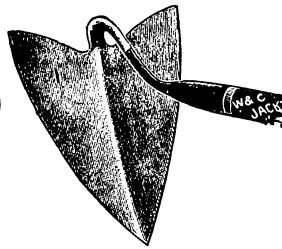
## High Grade Southern Hoes.



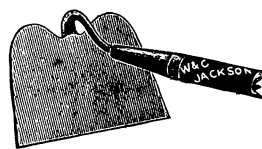
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**HUSKING GLOVES**  
New Pat. Perfect fit with lots of room. Insist on having Blair's. Take no others. They are the best leather and best shape and cheapest on the market. Their oil tan will not harden by wetting. Husking Plus that will not bend.  
**ASK YOUR JOBBER FOR THEM.**

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No. 052 Oil Calf, \$8 doz.  
Back View.  
For all styles.

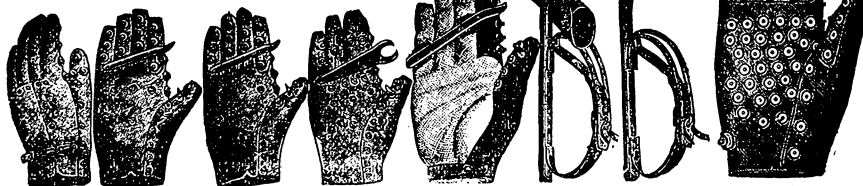
No. 140, Oil Calf, \$9 doz.  
No. 152, Yellow Lea, \$7.50.  
No. 142, Real Napa Goat, \$7 dz.

No. 150, Oil Calf, \$9 doz.  
No. 155, Hog, ....doz.

No. 170, Oil Calf, \$2 doz.

No. 165, \$10.50 gross.

No. 180, \$7 gross.



New Rivet Glove.

All rivets.

Never rips

Double thumb.

No sewed seams.

Extra heavy oil tan calf.

No.

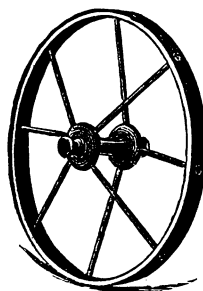
N. R. G.,

\$12

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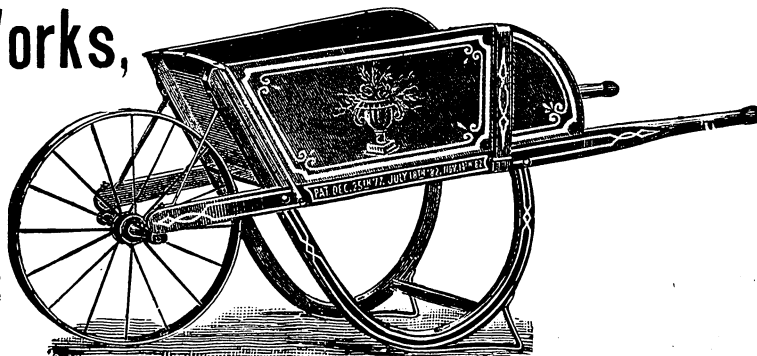
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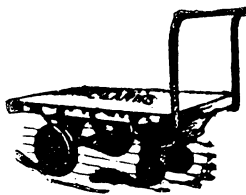
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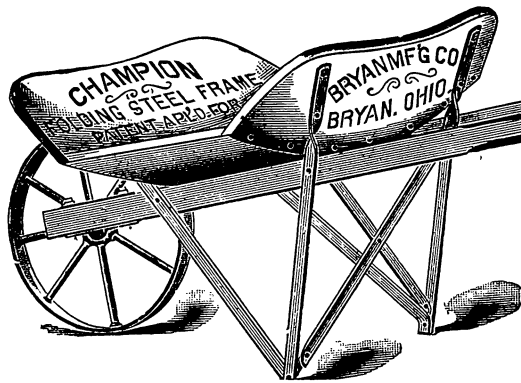
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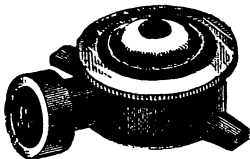


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Adjust.

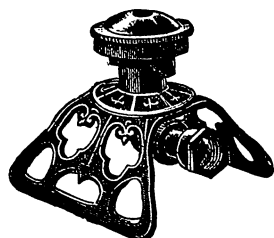
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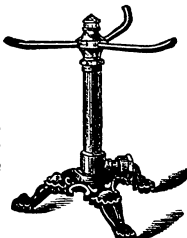
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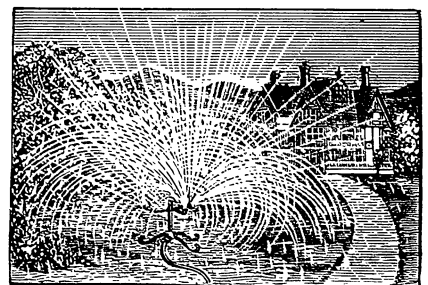
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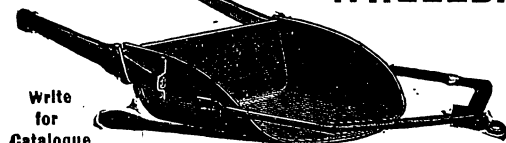
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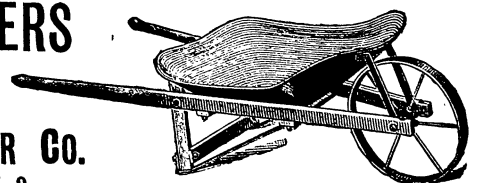
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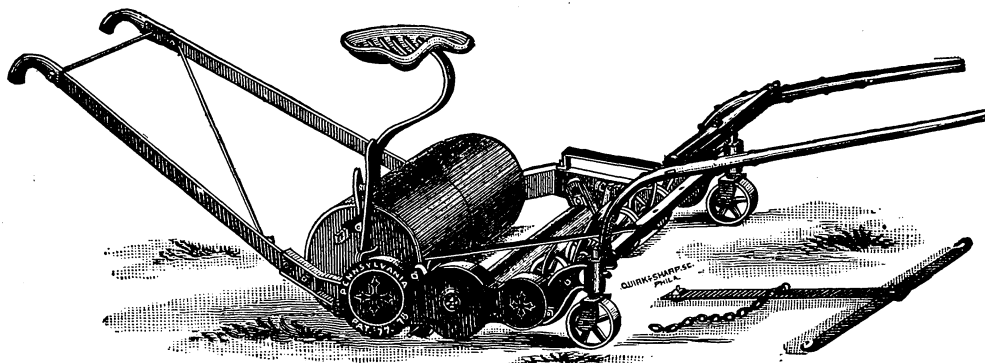
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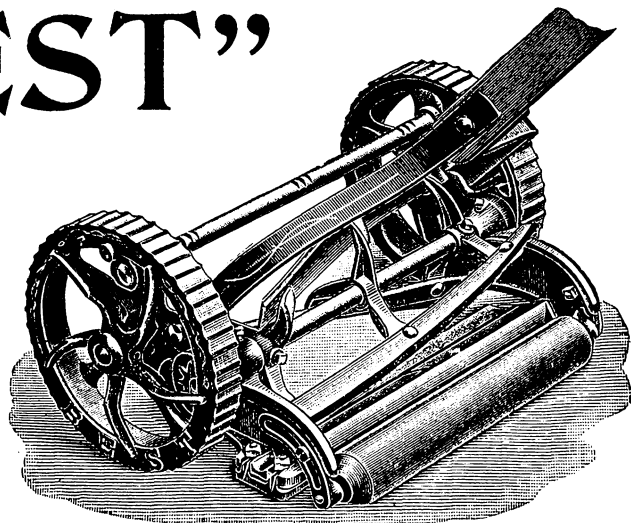
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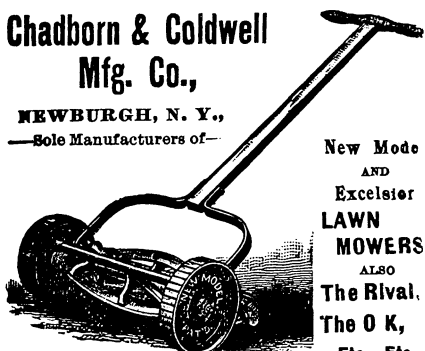


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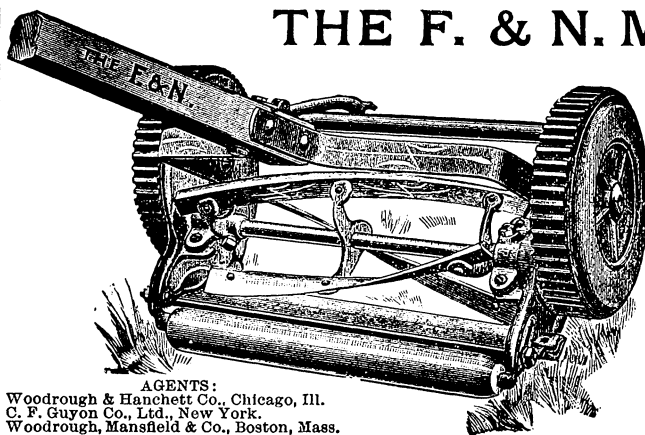
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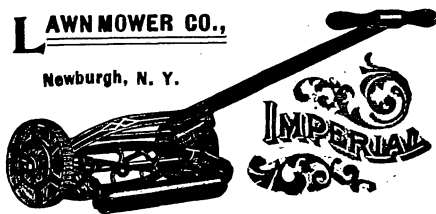


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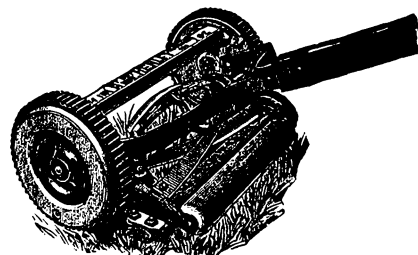
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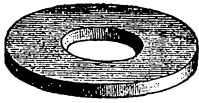
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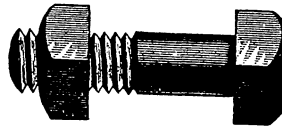
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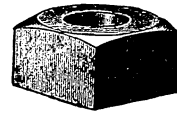
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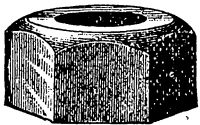
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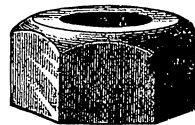
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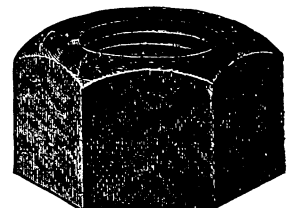
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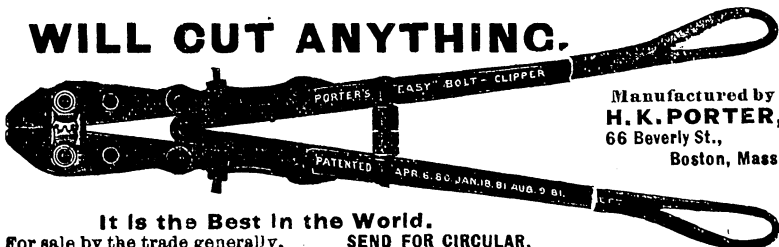
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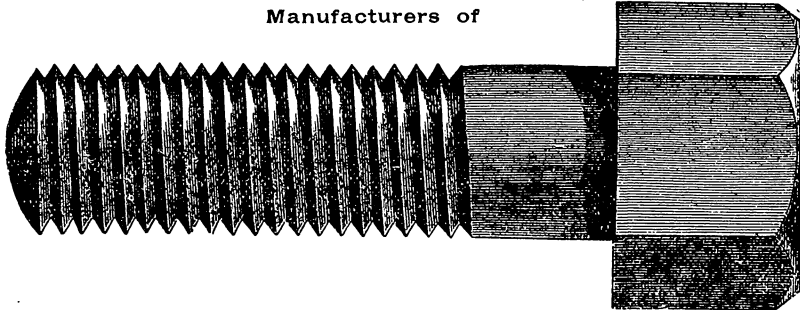
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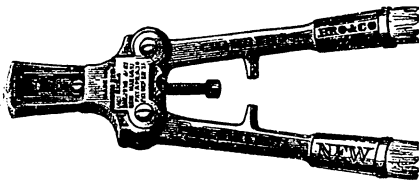
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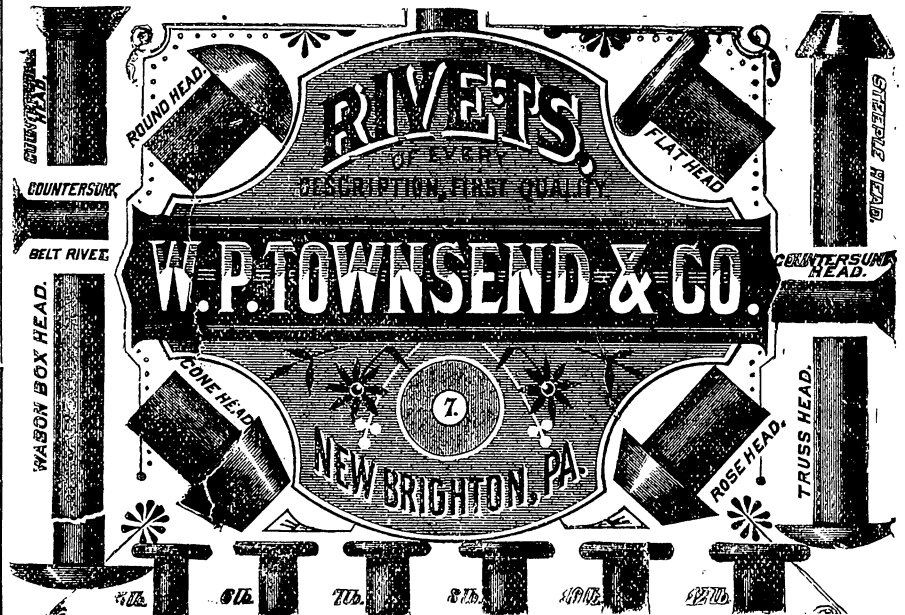
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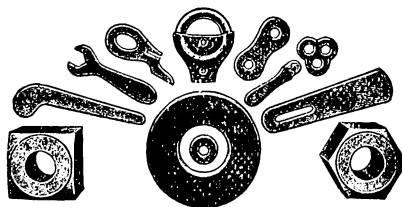


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## Bolt Cutters.

Chambers Bros. Co., Philadelphia.  
Howard Iron Works, Buffalo, N. Y.  
Porter, H. K., Boston, Mass.  
Wells Bros. & Co., Greenfield, Mass.

## Books.

Republic Press, 14 Lafayette Place, N. Y.  
Williams, David, 98-102 Reade, N. Y.

## Boring Machines.

Buckeye Mfg. Co., Union City, Ind.

## Box Banders.

Goodell, J. W., Burlington, Vt.

## Box Straps and Corners.

Cary Mfg. Co., 5 to 9 Elm St., N. Y.

## Boxes, Hdw. Shelf, &c.

Green, A. H., 22 Park Place, N. Y.  
Jones, Jesse & Co., Philadelphia, Pa.

## Brass, Manufacturers of.

Ansonia Brass & Copper Co., N. Y.  
David, John & Sons, 100 John, N. Y.  
Plume & Atwood Mfg. Co., N. Y.  
Randolph & Clowes, Waterbury, Conn.  
Rome Brass & Copper Co., Rome, N. Y.  
Scovill Mfg. Co., Waterbury, Conn.  
Waterbury Brass Co., 296 B'way, N. Y.

## Brass Butt Hinges.

Tiebout, W. & J., 16 & 18 Chambers.

## Brass Founders.

Cramp, Wm. & Sons S. & E. B. Co., Philadelphia, Pa.  
Eynous-Evans Mfg. Co., Philadelphia, Pa.  
Fralin, E. T., Lancaster, Pa.  
Haight & Clark, Albany, N. Y.  
Keys, W. W. & R. M. Co., Bridgeport, Conn.  
North Bros. Mfg. Co., Phila., Pa.  
Reeves, Paul S., Philadelphia.

## Brass Goods.

Brass Goods Mfg. Co., 88 Chambers.

## Bread and Cake Knives.

Cincinnati Mfg. Co., Cincinnati, O.  
Clausen Shear Co., Fremont, O.

## Bronze (Tobin).

Ansonia Bronze & Copper Co., 19-21 Cliff Street, N. Y.

## Brooms and Brushes.

Lay, Jos. & Co., Ridgeville, Ind.  
Rice Mfg. Co., New Durham, N. H.

## Builders' Hardware.

Deitz, A. E., 97 Chambers St., N. Y.  
Reading Hdw. Co., Reading, Pa.  
Yale & Towne Mfg. Co., Stamford, Ct.

## Burr Wheels.

Torrance Iron Co., Troy, N. Y.

## Butchers' Steels.

Chatillon, John & Sons, 85-89 Cliff St., N. Y.

## Butcher and Shoe Knives, Manufacturers of.

Chatillon, John & Sons, 85-89 Cliff St., N. Y.  
Goodell Co., Antrim, N. H.  
Wilson, John, Sheffield, England.

## Butts and Hinges.

Clark Mfg. Co., Buffalo, N. Y.  
McKinney Mfg. Co., Allegheny, Pa.  
Sabin Machine Co., Montpelier, Vt.  
Stanley Works, New Britain, Conn.  
Tiebout, W. & J., 16 Chambers, N. Y.  
Wrightsville Hdw. Co., Wrightsville, Pa.

## Caltipers and Dividers.

J. Stevens Arms and Tool Co., Chicopee Falls, Mass.  
Starrett, L. S., Athol, Mass.

## Car Axles.

Roberts, A. & P. & Co., Phila.

## Carboy Stands.

Wolf, W. & L., Philadelphia, Pa.

## Carriage Hardware, Makers of.

Clapp, E. D. Mfg. Co., Auburn, N. Y.  
Covert's Saddlery Works, Farmer, N. Y.  
Eaton, Richard, Auburn, N. Y.  
Scranton Forging Co., Scranton, Pa.  
Smith, H. D. & Co., Plantsville, Conn.

## Cartridge Reloading Tools.

Ideal Mfg. Co., New Haven, Conn.

## Carvers' Tools.

White, Van Glahn & Co., 15-17 Chatham Square, N. Y.

## Casters, Wheel, &c.

Clark G. P., Windsor Locks, Conn.

## Castings, Iron and Steel.

Allentown Hdw. Wks. Allentown, Pa.  
Booth, The Lloyd Co., Youngstown, O.  
Boston Casting Co., So. Boston, Mass.  
The Burr & Houston Co., Brooklyn, N. Y.  
Cheney, S. & Son, Manlius, N. Y.  
Chester Steel Casting Co., Phila.  
Chrome Steel Works, Brooklyn, N. Y.  
Eureka Cast Steel Co., Chester, Pa.  
Flagg, Stanley G. & Co., Phila.  
Garland Foundry Co., Cleveland, O.  
Haight & Clark, Albany, N. Y.  
King & Andrews Co., Chicago, Ill.  
Palmer & De Mooy Fdy. Co., Cleveland, O.  
Pratt & Cady Co., Hartford, Conn.  
Seestons Foundry Co., Bristol, Conn.  
Spencer's I. S. Sons, Guilford, Conn.  
Standard Fdy. & Mfg. Co., Cleveland, O.  
Torrance Iron Co., Troy, N. Y.  
Union Lock & Hdw. Co., Lancaster, Pa.  
Walker Mfg. Co., Cleveland, Ohio.  
Wetherill, Robert & Co., Chester, Pa.

## Castings, Malleable.

Arcade Malleable Iron Co., Worcester, Mass.  
Hammer & Co., Branford, Conn.  
Torrance Iron Co., Troy, N. Y.

## Catalogue Files.

Folding Paper Box Co., So. Bend, Ind.

## Chains.

Bradlee & Co., Philadelphia.  
Garland Chain Co., Rankin, Pa.  
Link Belt Engineering Co., Phila., Pa.  
McKay, Jas. & Co., Pittsburgh, Pa.

## Chimneys.

Phila. Engineering Works, Phila., Pa.

## Chisels, Manufacturers of.

Buck Bros., Milbury, Mass.  
Buck, Chas., Milbury, Mass.  
White, L. & I. J. Co., Buffalo, N. Y.

## Chucks.

Cushman Chuck Co., Hartford, Conn.  
Hogson & Pettis Mfg. Co., New Haven, Conn.  
Skinner Chuck Co., New Britain, Conn.  
Smith & Egge Mfg. Co., Bridgeport, Conn.  
Union Mfg. Co., 103 Chambers, N. Y.  
Whitlock, Wm., 39 Cortlandt St., N. Y.  
Whitton, D. E. Mach. Co., New London, Conn.

## Clamps.

Hammer & Co., Branford, Conn.  
Le Count, C. W., So. Norwalk, Conn.

## Coal.

Barns, C. K. & Co., Philadelphia, Pa.  
Wister, Francis, Philadelphia, Pa.

## Coal Hods.

Bucket Pump Co., Cincinnati, O.

## Coffee Mills.

Enterprise Mfg. Co., Phila., Pa.  
Parker, Chas. Co., Meriden, Conn.

## Coke.

Barns, C. K. & Co., Philadelphia, Pa.  
Housh, C. B. & Co., Philadelphia, Pa.  
Ratney, W. J., Cleveland, O.  
Wister, Francis, Philadelphia, Pa.

## Collections.

Hardware Board of Trade (Limited), 4 and 6 Warren, N. Y.

## Condensers.

Worthington, Henry R., 86 & 88 Liberty Street, N. Y.

## Conveying Machinery.

Brown Holsting & Conveying Machine Co., Cleveland, Ohio.  
Jeffrey Mfg. Co., Columbus, O.  
Link-Belt Engineering Co., Phila., Pa.

## Copper.

Ames Sword Co., Chicopee, Mass.  
Ansonia Brass & Copper Co., 19 and 21 Cliff, N. Y.  
Hendricks Bros., 49 Cliff, N. Y.  
New Haven Copper Co., 294 Pearl, N. Y.  
Randolph & Clowes, Waterbury, Conn.  
Rome Brass & Copper Co., Rome, N. Y.  
Wister, Francis, Philadelphia, Pa.

## Cordage.

Samson Cordage Works, Boston, Mass.

## Cork Screws.

Williamson, C. T. Wire Novelty Co., Newark, N. J.

## Corrugated Furnaces.

Continental Iron Wks., Brooklyn, N. Y.

## Corrugated Iron.

Cincinnati Corrugating Co., Piqua, O.  
Jersey City Galvanizing Co., 112 John St., N. Y.  
Moseley Iron Bridge & Roof Co., 5 Dey, N. Y.  
N. Y. Iron Roofing & Corrugating Co., Jersey City, N. J.

## Counting Machines.

Durant, W. N., Milwaukee, Wis.

## Cranes.

Maris & Beekley, Philadelphia, Pa.  
Ridgway, Craig & Sons, Coatesville, Pa.  
Sellers, Wm. & Co., Inc., Phila., Pa.  
Whiting Foundry Equipment Co., Chicago, Ill.  
Yale & Towne Mfg. Co., Stamford, Conn.

## Cupolas, Hot Blast.

Whiting Foundry Equipment Co., Chicago, Ill.

## Cutlery, Importers of.

Sickles, Sweet & Lyon, 35 Barclay, N. Y.

## Cutlery, Manufacturers of.

Bingham, W. Co., Cleveland, Ohio.  
Dane, Stoddard & Kendall, Boston, Mass.  
Goodell Co., Antrim, N. H.  
Northampton Cutlery Co., Northampton, Mass.  
Wilson, John, Sheffield, England.

## Cutlery Display Cases.

Union Show Case Co., Chicago, Ill.

## Dampers.

Arcade Mfg. Co., Freeport, Ill.  
Shepard, Sidney & Co., Buffalo, N. Y.

## Dies.

Wilson, J. Fred, Worcester, Mass.

## Die Forgings and Castings.

Bliss, E. W. Co., Brooklyn, N. Y.

## Dish Washers.

Bolgiano Mfg. Co., Baltimore, Md.

## Dog Collars.

Union Hardware Co., Torrington, Ct.

## Door Checks and Springs.

Bardsley, J., 149 & 151 Baxter St., N. Y.

## Door Knobs.

Perry & Whipple Co., New Haven, Ct.

## Door Springs.

Coiled Wire Belting Co., Jersey City, N. J.

## Drilling Machines.

Beaman & Smith, Providence, R. I.  
Bickford Drill & Tool Co., Cin., Ohio.  
Buffalo Forge Co., Buffalo, N. Y.  
Champion Blower & Forge Co., Lancaster, Pa.  
Colburn, A. M., New Haven, Conn.  
Dallet, Thos. H. & Co., Philadelphia.  
D'Amour & Little 204 E. 43d St., N. Y.  
Dietz, Schumacher & Co., Cincinnati, Ohio.  
Dwight Slate Machine Co., Hartford, Conn.  
Goddard, Asa, Worcester, Mass.  
Halsey, Jas. T., Philadelphia, Pa.  
Hamilton Mch. Tool Co., Hamilton, O.  
Herrick & Cowell, New Haven, Conn.  
Quint, A. D., Hartford, Conn.  
Sellers, Wm. & Co., Inc., Phila., Pa.  
Sigourney Tool Co., Hartford, Conn.  
Silver Mfg. Co., Salem, O.  
Wiley & Russell Mfg. Co., Greenfield, Mass.  
Woodward & Rogers, Hartford, Conn.

## Drop Forgings.

Billings & Spencer Co., Hartford, Conn.  
Boone, W. C. Mfg. Co., Bounton, N. J.  
Clapp, E. D. Mfg. Co., Auburn, N. Y.  
Eccles, Richard, Auburn, N. Y.  
Merrill Bros., Brooklyn, E. D.  
Miner & Peck Mfg. Co., New Haven, Ct.  
R. I. Tool Co., Providence, R. I.  
Scranton Forging Co., Scranton, Pa.  
Wilcox & Howe Co., Birmingham, Conn.  
Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.  
Wyman & Gordon, Worcester, Mass.

## Drop Presses.

Bliss, E. W. Co., Brooklyn, N. Y.  
Crosby, G. A. & Co., Chicago, Ill.  
Ferracute Mch. Co., Bridgeton, N. J.  
Miner & Peck Mfg. Co., New Haven, Conn.  
Stiles & Parker Press Co., Brooklyn, N. Y.  
Vulcan Iron Works, Chicago, Ill.  
Waterbury Farrel Foundry and Machine Co., Waterbury, Conn.

## Dumb Waiters.

Hutchinson, F. S. Co., 32 Warren Street, N. Y.  
Storm Mfg. Co., Newark, N. J.

## Dynamite.

New York Powder Co., 62 Liberty St., N. Y.

## Dynamos.

C. & C. Electric Co., 402 and 404 Greenwich St., N. Y.  
Colburn Electric Mfg. Co., Fitchburg, Mass.  
Zucker & Levett Chemical Co.,

**Egg Beaters.**

North Bros. Mfg. Co., Philadelphia, Pa.

**Electric Bells and Supplies.**

Ostrandere, W. R. & Co., 204 Fulton St., New York.  
Wollensak, J. F., Chicago, Ill.

**Electric Dynamo Machines.**

Hanson & Van Winkle Co., Newark, N.J.

**Elevators, Makers of.**

Link-Belt Engineering Co., Phila., Pa.  
Morse, Williams & Co., Phila., Pa.  
Penna. Elevator Engineering Co., Phila., Pa.  
Warner Elevator Mfg. Co., Cincinnati, Ohio.

**Emery and Emery Wheels.**

Cutter, Wood & Stevens, Boston, Mass.  
Diamond Mach. Co., Providence, R. I.  
N. Y. Belling & Packing Co., Ltd., N. Y.  
Northampton Emery Wheel Co., Leeds, Mass.  
Norton Emery Wheel Co., Worcester, Mass.  
Sterling Emery Wheel Co., 174 Fulton St., N. Y.  
Tanite Co., Stroudsburg, Pa.

**Emery Wheel Dressers.**

Bay State Stamping Co., Worcester, Mass.

**Engineers and Contractors.**

Aiken, Henry, Pittsburgh, Pa.  
Herrick, J. A., 284 Pearl St., N. Y.  
Kennedy, Julian, Philadelphia, Pa.  
Laughlin, Alex. & Co., Pittsburgh, Pa.  
Lean, D. R., Co., Pittsburgh, Pa.  
McClure, Amster & Co., Pittsburgh, Pa.  
Pittsburgh Iron & Steel Engineering Co., Pittsburgh, Pa.  
Smythe, S. R. Co., Incorporated, Pittsburgh, Pa.  
Swindell, W. & Bros., Pittsburgh, Pa.

**Engines, Gas and Gasoline.**

Buckeye Mfg. Co., Union City, Ind.  
Otto Gas Engine Works, Phila., Pa.  
Springfield Gas Engine Co., Springfield, Ohio.

**Engines, Steam, Makers of.**

Allis, E. P. Co., Milwaukee, Wis.  
Bass Foundry & Machine Works, Ft. Wayne, Ind.  
Chandler & Taylor Co., Indianapolis, Ind.  
Harris, Wm. A., Steam Engine Co., Providence, R. I.  
Lane & Bodley Co., Cincinnati, Ohio.  
Norwalk Iron Works Co., No. Norwalk, Conn.  
Phila. Engineering Works, Phila., Pa.  
Southward Foundry & Machine Co., Phila., Pa.  
Tod, William & Co., Youngstown, O.  
Totten & Hogg Iron & Steel Fdry. Co., Pittsburgh, Pa.  
Westwick, Jno. & Son, Galena, Ill.  
Wetherill, Robt. & Co., Chester, Pa.

**Exhaust Tumblers.**

Sweetser, W. A., Brockton, Mass.

**Expansion Bolts.**

Boone, W. C. Mfg. Co., Boonton, N. J.  
Church, Isaac, Toledo, O.  
Steward & Romaine Mfg. Co., Phila., Pa.

**Exporters.**

Flint & Co., 68 Broad St., N. Y.

**Faucets, Self-Measuring.**

Lane Bros., Poughkeepsie, N. Y.

**Faucets, Wooden, Makers of.**

John Sommer's Son, Newark, N. J.

**Feed-Water Heaters and Purifiers.**

Davis, I. B. & Son, Hartford, Conn.  
Harrison Safety Boiler Works, Phila., Pa.  
National Pipe Bending Co., New Haven, Conn.  
Taunton Locomotive Mfg. Co., Taunton, Mass.  
Webster, Warren & Co., Camden, N. J.  
Whitlock Coil Pipe Co., Elmwood, Conn.

**Fencing, Iron and Wire.**

Barnum, E. P., Detroit, Mich.  
Champion Iron Co., Kenton, O.  
Chess Bros., Pittsburgh, Pa.  
Clinton Wire Cloth Co., Clinton, Mass.  
Gilbert & Bennett Mfg. Co., 42 Cliff St., Kilmor, Co., Newburgh, N. Y.  
McCallip Fence & Wire Wks., Columbus, Ohio.  
The Van Dorn Iron Works Co., Cleveland, O.

**Files, Importers of.**

Moss, F. W., 80 John St., N. Y.

**Files and Rasps, Manufacturers of.**

Arcade File Works, Anderson, Ind.  
Banker & White, Troy, N. Y.  
Barnett, G. & H., 41 & 43 Richmond, Phila.  
McCaffrey File Co., Philadelphia.  
Nicholson File Co., Providence, R. I.

**Fire Brick, Makers of.**

Borgner, Cyrus, Philadelphia, Pa.  
Gardner, Jas. & Son, Cumberland, Md.  
Kreischer, B. & Sons, foot E. Houston St., N. Y.  
Maurer, H. & Son, 420 E. 23d, N. Y.  
Ostrandere Fire Brick Co., Troy, N. Y.  
Valentine, M. D. & Bro. Co., Woodbridge.

**Fire Doors.**

Coburn Trolley Track Mfg. Co., Holyoke, Mass.

**Fishing Tackle.**

Dame, Stoddard & Kendall, Boston, Mass.

**Flint and Emery Paper.**

Baeder, Adamson & Co., Phila., Pa.

**Flour Sifters.**

Bromwell Brush & Wire Goods Co., Cincinnati, Ohio.  
Meyers, Fred. J. Mfg. Co., Hamilton, O.

**Fodder Cutters.**

Silver Mfg. Co., Salem, O.

**Forges, Portable, &c.**

Buffalo Forge Co., Buffalo, N. Y.  
Champion Blower & Forge Co., Lancaster, Pa.  
Sturtevant, B. F. Co., Boston, Mass.

**Forgings, Iron and Steel.**

Bethlehem Iron Co., S. Bethlehem, Pa.  
Cambria Steel—Cambria Iron Co., Johnstown, Pa.  
Frankford Steel Co., Phila., Pa.  
Scranton Forging Co., Scranton, Pa.  
U. S. Projectile Co., Brooklyn, N. Y.

**Forks, Hay and Manure.**

Iowa Farming Tool Co., Ft. Madison, Iowa.  
Withington & Cooley Mfg. Co., Jackson, Mich.

**Foundry Facings.**

Dixon, Jos., Crucible Co., Jersey City, N. J.  
S. Obermayer Co., Cincinnati, O.  
Smith's Pattern Works, Akron, Ohio.

**Foundry Riddles.**

Estey, W. S., 63 Fulton, N. Y.

**Foundry Supplies.**

Diamond Clamp & Flask Co., Richmond, Ind.  
S. Obermayer Co., Cincinnati, O.  
Rice Mfg. Co., New Durham, N. H.  
Smith, J. D., Fdy. Supply Co., Cincinnati, O.  
Smith's Pattern Works, Akron, Ohio.

**Friction Clutches.**

Brown, A. & F., 17 Day St., N. Y.  
Keystone Clutch & Mch. Wks., Phila., Pa.  
Moore & White Co., Philadelphia, Pa.

**Friction Cone.**

Evans Friction Cone Co., Boston, Mass.

**Galvanized Material.**

Jersey City Galvanizing Co., 112 John St., N. Y.

**Galvanizing Kettles.**

Sands, Thos., Nashua, N. H.

**Gas Producers.**

Wood, R. D. & Co., Philadelphia, Pa.

**Gas Stoves.**

Boligiano Mfg. Co., Baltimore, Md.

**Gas & Steam Fitters' Supplies.**

Pancoast, Henry B. & Co., Phila., Pa.

**Gate Hinges.**

Wrightsville Hdw. Co., Wrightsville, Pa.

**Gear Cutters.**

D. E. Whiton Mach. Co., New London, Conn.

**Gears.**

Boston Gear Works, Boston, Mass.  
Gleason Tool Co., Rochester, N. Y.  
Lincoln Iron Works, Rutland, Vt.  
Poole, Robt. & Son Co., Baltimore, Md.  
U. S. Projectile Co., Brooklyn, N. Y.

**Glass Boards.**

Lutkin Rule Co., Saginaw, Mich.

**Glass Cutters.**

Monce, S. G., Bristol, Conn.

**Glue.**

Baeder, Adamson & Co., Phila., Pa.  
Dodd, A. W. & Co., Gloucester, Mass.  
Russia Cement Co., Gloucester, Mass.

**Grass Catchers.**

Supplee Hardware Co., Phila., Pa.

**Grate Guards.**

Dow Wire Works Co., Louisville, Ky.

**Grinding and Polishing Machines.**

Cutter, Wood & Stevens, Boston, Mass.  
Diamond Mach. Co., Providence, R. I.  
Herrick & Cowell, New Haven, Conn.  
Norton Emery Wheel Co., Worcester, Mass.

**Grindstone Dressing Machinery.**

Blake & Johnson, Waterbury, Conn.

**Grindstones.**

Cleveland Stove Co., Cleveland, O.

**Gun Implements.**

Union Hdw. Co., Torrington, Conn.

**Gunpowder, Makers of.**

Lafin & Rand Powder Co., 29 Murray St., N. Y.

**Handles.**

Cleveland Wood Turning Co., Cleveland, O.

**Hangers, Door.**

Coburn Trolley Track Mfg. Co., Holyoke, Mass.  
Lane Bros., Poughkeepsie, N. Y.

**Hardware Comm'n Merchants.**

Graham, John H. & Co., 111 Chambers St., New York.  
Jacobus, W. H., 90 Chambers, N. Y.

**Hardware Jobbers.**

White, Van Gland & Co., 15-17 Chatham Square, N. Y.

**Hardware Manufacturers.**

Stearns, E. C. & Co., Syracuse, N. Y.  
Streeter, N. R. & Co., Groton, N. Y.  
Union Mfg. Co., 103 Chambers, N. Y.  
Yale & Towne Mfg. Co., Stamford, Conn.

**Hardware Mfrs. Agents.**

Bingham, W. Co., Cleveland, O.  
Clarke, Thomas, St. John, N. B.  
Graham, John H. & Co., 113 Chambers, Sickles, Sweet & Lyon, 35 Barclay, N. Y.

**Hardware Specialties.**

Acme Shear Co., Bridgeport, Conn.  
Burger Bros., Philadelphia, Pa.  
Clark Mfg. Co., Buffalo, N. Y.  
Enterprise Mfg. Co., Philadelphia, Pa.  
Eck & Hecor Mfg. Co., St. Louis, Mo.  
Gwinner Mfg. Co., Hamilton, O.  
Johnson, S. C., Racine, Wis.  
New Britain Hdw. Mfg. Co., New Britain, Conn.  
North Bros. Mfg. Co., Philadelphia, Pa.  
Ranson Hdw. Co., Burlington, Vt.  
Scranton & Co., New Haven, Conn.  
Shepard, Sidney & Co., Buffalo, N. Y.  
Union Lock & Hdw. Co., Lancaster, Pa.  
Wilson, J. Fred., Worcester, Mass.  
Wrightsville Hdw. Co., Wrightsville, Pa.

**Harness Snaps.**

Covert Mfg. Co., West Troy, N. Y.  
Coverts' Saddlery Wks., Farmer, N. Y.  
Fitch, W. & E. T., New Haven, Conn.

**Heaters, Oil and Gas.**

Climax Mfg. Co., Chicago, Ill.

**Hoes.**

Withington & Cooley Mfg. Co., Jackson, Mich.

**Hoisting Machines.**

Box, Alfred & Co., 314 Green, Phila.  
Brown Hoisting & Conveying Mch. Co., Cleveland, Ohio.  
Byers, Jno. F. Mch. Co., Ravenna, O.  
Fulton Iron & Engine Wks., Detroit, Mich.  
Harrington, E. & Son, Co., Phila.  
Lane Bros., Poughkeepsie, N. Y.  
Lidgerwood Mfg. Co., 90 Liberty, N. Y.  
Lincoln Iron Works, Rutland, Vt.  
McCoy, Jos. F. & Co., 28 Warren St., Phila.  
Marls & Beekley, Philadelphia.  
Moore Mfg. & Fdy. Co., Milwaukee, Wis.  
Morse, Williams & Co., Phila.  
Sellers, Wm. & Co., Phila. and N. Y.  
Yale & Towne Mfg. Co., Stamford, Ct.

**Hollow Ware.**

Avery Stamping Co., Cleveland, O.  
Bronson Supply Co., Cleveland, Ohio.  
Cleveland Stamping & Tool Co., Cleveland, O.

**Hollow Ware, Aluminum.**

Wohler Aluminum Co., Chicago, Ill.

**Horse Nails, Makers of.**

Capewell Horse Nail Co., Hartford, Conn.  
National Horse Nail Co., Vergennes, Vt.  
Putnam Nail Co., Neponset, Boston, Mass.

**Horse and Mule Shoes, Makers of.**

Bryden Horse Shoe Co., Catsaqua, Pa.  
Burden Iron Co., Troy, N. Y.  
Crescent Horse Shoe & Iron Co., Max Meadows, Va.  
Diamond State Iron Co., Wilmington, Del.  
Leonard, J., 446 West St., N. Y.  
Old Long Island Iron & Nail Works Co., Richmond, Va.  
Phoenix Horse Shoe Co., Poughkeepsie, N. Y.  
Rhode Island Perkins Horse Shoe Co., Providence.  
Shoenberger & Co., Pittsburgh, Pa.  
Standard Horse Shoe Co., Boston, Mass.

**Hose.**

N. Y. Belling & Packing Co., Ltd., 15 Park Row, N. Y.

**Husting Gloves.**

Blair's Huskings Gloves.

**Hydrants, &c.**

McLean, John, 296 & 298 Monroe, N. Y.

**Hydraulic Forging.**

U. S. Projectile Co., Brooklyn, N. Y.

**Hydraulic Jacks.**

Dudgeon, Richard, 24 Columbia, N. Y.  
McCoy, Jos. F. Co., 26 Warren St., N. Y.

**Ice Cream Freezers.**

White Mountain Freezer Co., Nashua, N. H.

**Injectors.**

Eynon-Evans Mfg. Co., Philadelphia, Pa.

**Insurance, Boiler.**

Hartford Steam Boiler Inspection & Insurance Co., Hartford, Conn.

**Iron and Steel, Swedish.**

Lundberg, Gustaf, Boston, Mass.

**Iron Commission Brokers.**

Butze, Adolph, St. Louis, Mo.  
Corning, Edw. & Co., 29 B'way, N. Y.  
Cotton, Barclay W. & Co., Phila.  
Etting, Edw. J., Philadelphia.  
Hogan, John L. & Co., Philadelphia, Pa.  
Hoffman, J. W. & Co., Philadelphia.  
Levis, Henry & Co., Philadelphia.  
Keeley, Jerome & Co., Philadelphia.  
Lea, J. Tattall & Co., Philadelphia.  
Mohr, J. J., 430 Walnut, Philadelphia.  
Pilling & Crane, Philadelphia, Pa.  
Wister, L. & R. & Co., Phila., Pa.

**Iron Ore.**

Samuel, Frank, Philadelphia, Pa.

**Iron, Merchants.**

Barns, C. K. & Co., Philadelphia, Pa.  
Borden & Lovell, 70 West, N. Y.  
Bussenius & Cunliffe, Philadelphia.  
Corning, Edw. & Co., 20 B'way, N. Y.  
Cox, Justice, Jr., Philadelphia.  
Cotton, Barclay W. & Co., Phila.  
Hoffman, J. W. & Co., Philadelphia.  
Leonard, J., 446 West St., N. Y.  
Nicolis, Wheeler & Co., Philadelphia.  
Ogden & Wallace, 577 to 583 Greenwich St., N. Y.  
Pierce & Co., 29 Broadway, N. Y.  
Thomson, W. H. & Co., Phila., Pa.  
Wallace, Wm. H. & Co., 66 B'way, N. Y.  
Whitney, A. R. & Co., 17 B'way, N. Y.  
Wilson, E. H. & Co., Philadelphia.

**Iron, Importers.**

Abbott, Wheelock & Co., N. Y. and Boston.  
Lundberg, Gustaf, Boston, Mass.

**Iron, Sheet, Manufacturers of.**

Cambridge Iron & Steel Co., Cambridge, Ohio.  
W. Dewees Wood Co., Lim., McKeesport, Pa.

**Ironwork, Ornamental.**

Barnum, E. T., Detroit, Mich.  
Champion Iron Co., Kenton, O.  
Ludlow-Saylor Wire Co., St. Louis, Mo.  
The Van Dorn Iron Works Co., Cleveland, O.

**Keys.**

Wollensak, J. F., Chicago, Ill.

**Knife and Tool Grinders.**

Tracy, A. J. Co., Ltd., 18 Cliff St., N. Y.

**Ladles.**

Whiting Fdy. Equipment Co., Chicago, Ill.

**Lanterns.**

Rochester Lamp Co., 42 Park Place, New York.  
Steam Gauge & Lantern Co., Syracuse, N. Y.

**Lathes.**

Beaman & Smith, Providence, R. I.  
Dietz, Schumacher & Co., Cincinnati, O.  
Draper Machine Tool Co., Worcester, Mass.  
Harrington, E. & Son, Co., Phila., Pa.  
Johnson, Israel H., Jr., & Co., Philadelphia, Pa.  
New Haven Mfg. Co., New Haven, Conn.  
Sebastian Lathe Co., Cincinnati, O.  
Seneca Falls Mfg. Co., Seneca Falls, N. Y.

**Lathing, Expanded Metal.**

Chess Bros., Pittsburgh, Pa.

**Lathing, Wire.**

Clinton Wire Cloth Co., Clinton, Mass.  
N. J. Wire Cloth Co., Trenton, N. J.  
Wright & Colton Wire Cloth Co., Worcester, Mass.

**Lawn Mowers.**

Anderson, F. S. & Co., Richmond, Ind.  
Blair Mfg. Co., Springfield, Mass.  
Chadborn & Coldwell Mfg. Co., Newburg, N. Y.  
Coldwell Lawn Mower Co., Newburg, N. Y.  
F. & N. Mfg. Co., Richmond, Ind.  
Henley, M. C., Richmond, Ind.  
Supplee Hdw. Co., Phila., Pa.

**Lawn Rakes.**

Gibbs Mfg. Co., Canton, Ohio.

Kohler, F. E. & Co., Canton, O.

**Lawn Sprinklers.**

Blair Mfg. Co., Springfield, Mass.  
Eute & Henger Mfg. Co., St. Louis, Mo.  
McGowan, John H. Co., Cincinnati, O.

**Letters and Figures, Metallic.**

White, A. A. & Co., Providence, R. I.

**Letters, Paper.**

Tablet & Ticket Co., Chicago, Ill.

**Levels.**

Richardson, C. F. & Son, Athol, Mass.

**Locks and Knobs, Manufacturers of.**

Dietz, A. E., 97 Chambers, N. Y.  
Reading Hdw. Co., Reading, Pa.  
Smith & Egge Mfg. Co., Bridgeport, Conn.  
Yale & Towne Mfg. Co., Stamford, Conn.

**Lubricants.**

Dixon, Jos., Crucible Co., Jersey City, N. J.

**Machinery.**

Am. Tool Works, Cleveland, Ohio.  
Ayer, H. C. & Gleason Co., Phila., Pa.  
Barnes, W. F. & John, Rockford, Ill.  
Beaman & Smith, Providence, R. I.  
Bement, Miles & Co., Philadelphia, Pa.  
Bigelow, C. E., 45 Day, N. Y.  
Bisnall & Keeler Mfg. Co., St. Louis.  
Bliss, E. W. Co., Brooklyn, N. Y.  
Briggs, Marvin, 12 Broadway, N. Y.  
Bullard Mch. Tool Co., Bridgeport, Conn.  
Carlin's Sons, Thos., Allegheny, Pa.  
Clapp, Geo. M., agt., 74 Cortlandt, N. Y.  
Detrick & Harvey Mch. Co., Baltimore, Md.  
Dietz, Schumacher & Co., Cincinnati, Ohio.  
Fitchburg Mch. Works, Fitchburg, Mass.  
Garvin Mch. Co., Laight & Canal Sts.  
Gould & Eberhardt, Newark, N. J.  
Hamilton Mch. Tool Co., Hamilton, O.  
Harrington, E. & Son, Co., Phila., Pa.  
Hendey Machine Co., Torrington, Ct.  
Hill, Clarke & Co., Boston, Mass.  
Howard & Morse, 45 Fulton St., N. Y.  
Johnson, Israel H., Jr., & Co., Phila.  
Jones & Lamson Mch. Co., Springfield, Vt.  
Lodge & Davis Mch. Tool Co., Cincinnati, O.  
Lodge & Shipley Mch. Tool Co., Cincinnati, O.  
McCabe, J. J., 68 Cortlandt, N. Y.  
Machinists' Supply Co., Rochester, N. Y.  
Manville, E. J., Mch. Co., Waterbury, Conn.  
Newark Mch. Tool Wks., Newark, N. J.  
New Haven Mfg. Co., New Haven, Ct.  
New York Machinery Depot, 178 Broadway, New York.  
Niles Tool Wks., 138 Liberty St., N. Y.  
Pittsburgh Mfg. Co., Pittsburgh, Pa.



- Place, Geo., 145 Broadway, N. Y.  
 Poole, Robt. & Son Co., Baltimore, Md.  
 Powell Planer Co., Worcester, Mass.  
 Prentiss Tool & Supply Co., N. Y.  
 Scranton Supply & Mchry. Co., Scranton, Pa.  
 Selbert, J. M., Philadelphia, Pa.  
 Sellers, Wm. & Co., Phila.  
 Seyfert's Sons, L. F., Philadelphia, Pa.  
 Sigourney Tool Co., Hartford, Conn.  
 Steptoe, J. & Co., Cincinnati, O.  
 Stow Flexible Shaft Co., Ltd., Phila.  
 Toomey, Frank, Philadelphia, Pa.  
 Walker Mfg. Co., Cleveland, O.  
 Wetherill, Robert & Co., Chester, Pa.  
 Wilson, W. A., Rochester, N. Y.
- Machinery for Hardware Manufacturers.**  
 Adt, Jno. & Son, New Haven, Conn.
- Machine Knives.**  
 Loring, Coes & Co., Worcester, Mass.  
 Simonds Mfg. Co., Fitchburg, Mass.
- Machine Screws.**  
 Rubbell, Harvey, Bridgeport, Ct.  
 New Britain Hdw. Mfg. Co., New Britain, Conn.  
 Rhode Island Tool Co., Providence, R.I.
- Machine Tools.—See Machinery.**
- Machine Work.**  
 Papping, J., 58th St. & 11th Ave., N. Y. City.
- Machinists' Scales.**  
 Conin & Leighton, Syracuse, N. Y.  
 Starrett, L. S., Athol, Mass.
- Machinists' Tools and Supplies.**  
 King, J. M. & Co., Watford, N. Y.  
 Sellers, Wm. & Co., Inc., Phila.
- Manufacturing Sites.**  
 Chicago, Milwaukee & St. Paul R. R., Chicago, Ill.
- Measuring Tapes.**  
 Lufkin Rule Co., Saginaw, Mich.
- Meat Choppers.**  
 Enterprise Mfg. Co., Philadelphia, Pa.
- Meat Cutters.**  
 North Bros. Mfg. Co., Philadelphia, Pa.
- Mechanical Instruction.**  
 Correspondence School of Mechanics, Scranton, Pa.
- Metals.**  
 Fearing, Wm. S., 100 Chambers, N. Y.  
 Hendricks Bros., 49 Cliff, N. Y.
- Metal Brokers.**  
 American Metal Co., N. Y.
- Metal Saws.**  
 Q. & C. Co., Chicago, Ill.
- Metallurgists.**  
 Britton, J., Blodgett, Phila., Pa.
- Mining Knives.**  
 Palmer Hdw. Mfg. Co., Troy, N. Y.  
 Streeter, N. R. & Co., Groton, N. Y.
- Mine Lamps.**  
 Darby, Edw. & Sons, Phila., Pa.  
 Leonard, B. E., Scranton, Pa.
- Mining Screens.**  
 Harrington & King Perforating Co., Chicago, Ill.  
 Howard & Morse, 45 Fulton, N. Y.
- Mining Machinery.**  
 Allis, E. P. Co., Milwaukee, Wis.
- Models, Makers of.**  
 Franklin, H. H. Mfg. Co., Syracuse, N. Y.  
 Ideal Machine Works, Hartford, Conn.
- Molding Sand.**  
 Obermayer, S. Co., Cincinnati, O.
- Motors, Water and Electric.**  
 Boigiano Mfg. Co., Baltimore, Md.  
 C. & C. Electric Co., 402 and 404 Greenwich St., N. Y.  
 Dallett, Thomas H. & Co., Phila., Pa.
- Nail Keg Stock.**  
 Crescent Mfg. Co., Detroit, Mich.
- Nail Machinery.**  
 Pittsburgh Mfg. Co., Pittsburgh, Pa.
- Nail and Tack Pullers.**  
 Am. Specialty Co., Hartford, Conn.  
 Scranton & Co., New Haven, Conn.
- Nails (Cut) and Spikes.**  
 Borden & Lovell, 70 West, N. Y.  
 Pottstown Iron Co., Pottstown, Pa.  
 Riverside Iron Wks., Wheeling, W. Va.
- Nickel Platers' Supplies.**  
 Hanson & Van Winkle Co., Newark, N. J.  
 Zucker & Levett & Loeb Co., 10 to 14 Grand St., N. Y.
- Nickel Plating.**  
 Rhodes, L. E. Co., Hartford, Conn.
- Norway Shapes, Rollers of.**  
 Rowland, William & Harvey, Frankford, Philadelphia.
- Novelty Manufacturers.**  
 Franklin, H. H. Mfg. Co., Syracuse, N. Y.  
 Ideal Machine Works, Hartford, Conn.
- Nut Machines.**  
 Dunham Nut Co., Unionville, Ct.
- Nuts, Bolts, &c., Makers of.**  
 American Bolt Co., Lowell, Mass.  
 American Screw Co., Providence, R. I.  
 Blake & Johnson, Waterbury, Conn.  
 Dunham Nut Co., Unionville, Conn.  
 Haskell, Wm. H. Co., Pawtucket, R. I.  
 Mt. Carmel Bolt Co., Mt. Carmel, Conn.  
 Pennsylvania Bolt & Nut Co., Lebanon, Pa.  
 Port Chester Bolt & Nut Co., Port Chester, N. Y.  
 Rhode Island Tool Co., Providence, R. I.  
 Russell, Burdall & Ward, Port Chester, N. Y.  
 Sternbergh, J. H. & Son, Reading, Pa.  
 Wilson, J. Fred, Worcester, Mass.  
 Wm. H. Haskell Co., Pawtucket, R. I.
- Oil Cups and Lubricators.**  
 Sherwood Mfg. Co., Buffalo, N. Y.
- Oilers.**  
 Wilnot & Hobbs Mfg. Co., Bridgeport, Conn.
- Oilless Anti-Friction Metals.**  
 North American Metalline Co., Long Island City, N. Y.
- Oil Stones.**  
 Pike Mfg. Co., Pike Station, N. H.
- Ores.**  
 Wister, Francis, Philadelphia, Pa.
- Ox Shoes.**  
 Millers Falls Co., 93 Reade St., N. Y.  
 Scranton Forging Co., Scranton, Pa.
- Packing.**  
 Morrison, Robert, St. Louis, Mo.  
 N. Y. Belting & Packing Co., Ltd., N. Y.
- Padlocks.**  
 Ames Sword Co., Chicopee, Mass.  
 Fraim, E. T., Lancaster, Pa.  
 Union Lock & Hdw. Co., Lancaster, Pa.  
 Wolf, W. & L., Phila., Pa.
- Pails.**  
 Richmond Cedar Wks., Richmond, Va.
- Paint Burners.**  
 Dangler Stove & Mfg. Co., Cleveland, Ohio.
- Paint Cans.**  
 Wilnot & Hobbs Mfg. Co., Bridgeport, Conn.
- Pants Stretcher.**  
 Covert Mfg. Co., West Troy, N. Y.
- Patent Solicitors.**  
 Butler, C. N., Phila., Pa.  
 Jenner, H. W. T., Washington, D. C.  
 Howson & Howson, Philadelphia and Washington.  
 Stocking, E. B., Washington, D. C.
- Pattern Letters.**  
 Wells, Heber, 157 William St., N. Y.
- Perforated Metal.**  
 Clinton Wire Cloth Co., Clinton, Mass.  
 Harrington & King Perforating Co., Chicago, Ill.  
 Hendrick Mfg. Co., Ltd., Carbondale, Pa.
- Phosphor Bronze.**  
 Phosphor Bronze Smelting Co., Limited, Philadelphia.
- Phosphor Tin.**  
 Crescent Phosphorized Metal Co., Philadelphia, Pa.  
 Halk & Naumann, 516 Pearl, N. Y.
- Picks and Mattocks.**  
 Plumb, Fayette R., Philadelphia, Pa.
- Pig Iron.**  
 Houston, C. B. & Co., Philadelphia, Pa.  
 Montour Iron & Steel Co., Danville, Pa.  
 Naylor & Co., 45 Wall, N. Y.  
 Pilling & Crane, Philadelphia, Pa.  
 Samuel, Frank, Philadelphia, Pa.
- Pig Iron Storage.**  
 Am. Pig Iron Storage Warrant Co., 44 Wall, N. Y.
- Pile Drivers.**  
 Vulcan Iron Works, Chicago, Ill.
- Pipe, Bent.**  
 National Pipe Bending Co., New Haven, Conn.
- Pipe Cutting and Threading Machines.**  
 Armstrong Mfg. Co., Bridgeport, Conn.  
 Bignall & Keeler Mfg. Co., St. Louis, Mo.  
 Drick & Harvey Mch. Co., Baltimore, Md.  
 Merrill Mfg. Co., Toledo, O.  
 Pancoast, Henry B. & Co., Phila.  
 Saunderson's Sons, D., Yonkers, N. Y.  
 Walworth Mfg. Co., Boston, Mass.
- Pipe Grips.**  
 Prentiss Vise Co., 44 Barclay, N. Y.
- Pipes, Fittings, &c., Makers of.**  
 McNab & Harlin Mfg. Co., N. Y.
- Pipe, Water and Gas, Makers of.**  
 Donaldson Iron Co., Emaus, Pa.  
 Riverside Iron Works, Wheeling, W. Va.  
 Wood, R. D. & Co., Philadelphia, Pa.
- Plane Irons, Manufacturers of.**  
 Buck Bros., Millbury, Mass.  
 Buck, Chas., Millbury, Mass.
- Planers.**  
 Detrick & Harvey Mch. Co., Baltimore, Md.  
 New Haven Mfg. Co., New Haven, Conn.  
 Powell Planer Co., Worcester, Mass.  
 Wilson, W. A., Worcester, Mass.
- Planes, Manufacturers of.**  
 Stanley Rule & Level Co., N. Y.
- Plated Ware.**  
 Boardman, L. & Son, New Haddam, Ct.  
 Holmes & Edwards Silver Co., Bridgeport, Conn.  
 Rogers, Wm. Mfg. Co., Hartford, Ct.
- Plate, Iron and Steel, Mfrs. of.**  
 Aetna-Standard Iron & Steel Co., Bridgeport, O.  
 Lukens Iron & Steel Co., Coatesville, Pa.  
 Mahoning Valley Iron Co., Youngstown, Ohio.  
 Moorhead-McLean Co., Pittsburgh, Pa.  
 McIlvain & Sons, Reading, Pa.  
 Pottstown Iron Co., Pottstown, Pa.  
 Pottsville Iron & Steel Co., Pottsville, Pa.  
 Singer, Nimick & Co., Pittsburgh, Pa.  
 The Mahoning Valley Iron Co., Youngstown, O.  
 Wood, Alan Co., Philadelphia.
- Plating, Nickel, Brass and Silver.**  
 Wilnot & Hobbs Mfg. Co., Bridgeport, Conn.
- Polishing Machines.**  
 Watson & Stillman, 204 E. 43d, N. Y.
- Post Hole Diggers.**  
 Gibbs Mfg. Co., Canton, Ohio.  
 Kohler, F. E. & Co., Canton, O.
- Poultry Nettings.**  
 Sargent, E. T., Detroit, Mich.  
 Gilbert & Bennett Mfg. Co., 42 Cliff St., N. Y.  
 N. J. Wire Cloth Co., Trenton, N. J.  
 "Silver Finish."  
 Tyler Wire Works Co., W. S., Cleveland, O.  
 Wright & Colton Wire Cloth Co., Worcester, Mass.
- Powder.**  
 Laffin & Rand Powder Co., 29 Murray.  
 New York Powder Co., 62 Liberty St., N. Y.
- Power Hammers.**  
 Dienelt & Eisenhardt, Philadelphia.  
 Dupont Mfg. Co., St. Johnsbury, Vt.  
 Jenkins & Lingle, Bellefonte, Pa.  
 Long & Alstatter Co., Hamilton, Ohio.  
 Miner & Peck Mfg. Co., New Haven Conn.  
 Scranton & Co., New Haven, Conn.
- Power Transmitting Machinery.**  
 Dodge Mfg. Co., Mishawaka, Ind.
- Presses, Dies, &c.**  
 E. W. Bliss Co., Brooklyn, N. Y.  
 Crosby, G. A. & Co., Chicago, Ill.  
 Ferracute Mch. Co., Bridgeport, N. J.  
 Stiles & Parker Press Co., Brooklyn, N. Y.  
 Waterbury Mch. Co., Waterbury, Ct.
- Presses, Power, Makers of.**  
 Bliss, E. W. Co., Brooklyn, N. Y.  
 Manville, E. J. Mch. Co., Waterbury, Ct.  
 Merriman, A. H., Meriden, Conn.  
 Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.
- Pulleys.**  
 Brown, A. & F., 17 Dey St., N. Y.  
 Dodge Mfg. Co., Mishawaka, Ind.  
 Keystone Clutch Mch. Wks., Phila., Pa.  
 Reading Wood Pulley Co., Reading, Pa.  
 Reeves Pulley Co., Columbus, Ind.
- Pulverizing Mills.**  
 Bradley Pulverizer Co., Boston, Mass.
- Pumping Machinery.**  
 Dean Bros. Steam Pump Works, Indianapolis, Ind.  
 Goulds Mfg. Co., Seneca Falls, N. Y.  
 Hooker-Corville Steam Pump Co., St. Louis, Mo.  
 Lucas, C. O. & Co., Greenville, Ohio.  
 McGowan, J. H. & Co., Cincinnati, O.  
 Maslin, J. & Son, Jersey City, N. J.  
 Norwalk Iron Works Co., So. Norwalk Conn.  
 Southwark Fdy. & Mch. Co., Phila., Pa.  
 Valley Pump Works, Easthampton, Worthington, Henry R., 86 and 88 Liberty St., N. Y.
- Pumps, Makers of.**  
 Emory Co., Salem, O.  
 Douglas, W. & B., Middletown, Conn.  
 Goulds Mfg. Co., Seneca Falls, N. Y.  
 Miller, C. & Sons, Utica, N. Y.  
 Myers, F. E. & Bro., Ashland, O.  
 Peters Pump Co., Kewanee, Ill.  
 Red Jacket Mfg. Co., Davenport, Iowa.
- Punches.**  
 Richards, I. P., Providence, R. I.
- Punches and Shears, Hand and Power.**  
 E. W. Bliss Co., Brooklyn, N. Y.  
 Crosby, G. A. & Co., Chicago, Ill.  
 Ferracute Mch. Co., Bridgeport, N. J.  
 Long & Alstatter Co., Hamilton, Ohio.  
 Stiles & Parker Press Co., Brooklyn, N. Y.  
 Wals & Ross Punch & Shear Co., Cincinnati, Ohio.  
 Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.  
 Watson & Stillman, 204 E. 43d, N. Y.
- Rails, Old and New.**  
 Perry, W. H. & Co., Providence, R. I.
- Rat and Mouse Traps.**  
 Burditt & Williams, Boston, Mass.  
 Estey, W. S., 65 Fulton, N. Y.  
 Excelsior Cutlery Co., Worcester, Mass.
- Reels.**  
 Hendryx, A. B. Co., New Haven, Conn.
- Refrigerator Door Fasteners.**  
 Conroy, P. J. & Co., Philadelphia.
- Rivers.**  
 Blake & Johnson, Waterbury, Conn.  
 Burden Iron Co., Troy, N. Y.  
 Clark & Cowles, Plainville, Conn.  
 Cobb & Drew, Plymouth, Mass.  
 New England Screw Co., Boston, Mass.  
 Sternbergh, J. H. & Son, Reading, Pa.  
 Townsend, W. P. & Co., New Brighton, Pa.
- Riveting Machines.**  
 Adt, Jno. & Sons, New Haven, Conn.
- Rolling Mill Machinery.**  
 Birmingham Iron F'dry, Birmingham, Conn.  
 Booth, The Lloyd Co., Youngstown, O.  
 Leachway Foundry & Mch. Co., Pittsburgh, Pa.  
 Morgan Construction Co., Worcester, Mass.  
 Robinson-Rea Mfg. Co., Pittsburgh, Pa.  
 Totten & Hogg Iron and Steel F'dry Co., Pittsburgh, Pa.  
 Trechway Mfg. Co., Pittsburgh, Pa.  
 Waterbury Farrel Foundry & Mch. Co., Waterbury, Conn.
- Rolls, Chilled, Sand and Steel.**  
 Birmingham Iron Foundry, Birmingham, Conn.  
 Booth, The Lloyd Co., Youngstown, O.  
 East Chicago F'dry Co., Chicago, Ill.  
 Garrison, A. F'dry Co., Pittsburgh, Pa.  
 Robinson-Rea Mfg. Co., Pittsburgh, Pa.  
 Seaman, Sleeth & Black, Pittsburgh.  
 Totten & Hogg Iron and Steel F'dry Co., Pittsburgh, Pa.
- Roofing.**  
 Cincinnati Corrugating Co., Piqua, O.  
 N. Y. Iron Roofing & Corrugating Co., Jersey City, N. J.
- Rope and Web Goods.**  
 Covert Mfg. Co., West Troy, N. Y.  
 Covert's Saddlery Wks., Farmer, N. Y.
- Rope Wheels.**  
 Cresson, Geo. V. Co., Philadelphia, Pa.
- Rubber Goods.**  
 Canfield, H. O., Bridgeport, Conn.
- Rules, Manufacturers of.**  
 Stanley Rule & Level Co., 29 Chambers.
- Sad Irons.**  
 Enterprise Mfg. Co., Phila., Pa.  
 Streeter, N. R. & Co., Groton, N. Y.
- Sad Irons, Gas.**  
 Boigiano Mfg. Co., Baltimore, Md.
- Sand Paper.**  
 Baeder, Adamson & Co., Phila., Pa.
- Sash Balances.**  
 Caldwell Mfg. Co., Rochester, N. Y.  
 Fullman Sash Balance Co., Rochester, N. Y.
- Sash Cords and Chains.**  
 Morton, Thos., 65 Elizabeth, N. Y.  
 Ossawan Mills Co., Norwich, Conn.  
 Samson Cordage Works, Boston, Mass.  
 Smith & Egge Mfg. Co., Bridgeport.
- Sash Locks.**  
 Champion Safety Lock Co., Cleveland, Ohio.
- Sash Pulleys.**  
 Palmer Hardware Mfg. Co., Troy, N. Y.
- Sash Weights.**  
 Brown, E. E. & Co., Philadelphia, Pa.  
 Norton Bros., Chicago, Ill.
- Saw Filing Machines.**  
 Diston, Henry & Sons, Philadelphia, Pa.
- Saws, Makers of.**  
 Atkins, E. C. & Co., Indianapolis, Ind.  
 Butler Mfg. Co., Boston, Mass.  
 Diston, Henry & Sons, Phila., Pa.  
 National Saw Co., Newark, N. J.  
 Simonds Mfg. Co., Fitchburg, Mass.
- Saw Sets.**  
 Taintor Mfg. Co., 84-86 Chambers, N. Y.
- Saw Vises.**  
 Seneca Falls Mfg. Co., Seneca Falls, N. Y.
- Sawing Machines.**  
 Q. & C. Co., Chicago, Ill.
- Scales, Manufacturers of.**  
 Buffalo Scale Co., Buffalo, N. Y.  
 Chadillon, John & Sons, 85-89 Cliff, N. Y.  
 Standard Scale & Fixture Co., St. Louis, Mo.
- Scrapers, Road.**  
 Sidney Steel Scraper Co., Sidney, O.
- Screens, Coal and Ore.**  
 Hendrick Mfg. Co., Ltd., Carbondale, Pa.
- Screw Cutting Machinery.**  
 Wells Bros. & Co., Greenfield, Mass.  
 Wiley & Russell Mfg. Co., Greenfield, Mass.
- Screw Drivers.**  
 Brown, R. H. & Co., New Haven, Conn.  
 Mayhew, H. C. O., Shelburne Falls, Mass.
- Screw Plate and Pipe Cutter.**  
 Jarecki Mfg. Co., Erie, Pa.
- Screws, Makers of.**  
 American Screw Co., Providence, R. I.  
 Blake & Johnson, Waterbury, Conn.  
 Wm. H. Haskell Co., Pawtucket.  
 Miles, F. S., 205 Quarry, Philadelphia.  
 New England Screw Co., Boston, Mass.  
 Reynolds & Co., New Haven, Conn.  
 Worcester Machine Screw Co., Worcester, Mass.
- Scroll Saws.**  
 Barnes, W. F. & John, Rockford, Ill.  
 Seneca Falls Mfg. Co., Seneca Falls, N. Y.
- Scythe Stones and Whetstones.**  
 Pike Mfg. Co., Pike Station, N. H.  
 Cleveland Stone Co., Cleveland, O.
- Sewer Pipes.**  
 Sharon Clay Mfg. Co., Sharon, Pa.
- Shade Hangers.**  
 South, W. A. Co., Salem, Mass.
- Shafting, Makers of.**  
 Brown, A. & F., 17 Dey St., N. Y.  
 Cresson, Geo. V. Co., Philadelphia, Pa.  
 Fairmount Mch. Co., Philadelphia, Pa.  
 Sellers, Wm. & Co., Inc., Phila., Pa.  
 Stow Mfg. Co., Binghamton, N. Y.
- Shaft Support.**  
 Decatur Shaft Support Co., Decatur, Ill.
- Shaped Iron and Steel, Manufacturers of.**  
 Aetna-Standard Iron & Steel Co., Bridgeport, O.  
 East Chicago F'dry Co., Chicago, Ill.



Allentown Rolling Mill, Allentown, Pa.  
Lockhart Iron & Steel Co., Pittsburgh, Pa.  
Passaic Rolling Mill Co., Paterson, N.J.  
The Phoenix Iron Co., Phila., Pa.  
Pottsville Iron & Steel Co., Pottsville, Pa.  
Roberts, A. & P. & Co., Phila., Pa.  
Tudor Iron Works, St. Louis, Mo.

#### Shears and Scissors.

Acme Shear Co., Bridgeport, Conn.  
Claus Shear Co., Fremont, Ohio.  
Heinrichs, R. Sons Co., Newark N. J.

#### Sheet Iron and Steel, Manufacturers of.

Atna-Standard Iron and Steel Co., Bridgeport, O.  
Cambridge Iron & Steel Co., Cambridge, Ohio.  
Jersey City Galvanizing Co., 112 John St., N. Y.  
Mahoning Valley Iron Co., Livingston, Ohio.  
Morehead-McCleane Co., Pittsburgh, Pa.  
Pierston & Co., 29 Broadway, N. Y.  
Singer, Nimick & Co., Ltd., Pittsburgh, Pa.  
The Mahoning Valley Iron Co., Youngstown, O.  
Alan Wood Co., Philadelphia.  
W. Dewees Wood Co., McKeesport, Pa.

#### Sheet Zinc.

Mathlessen & Hegeler Zinc Co., La Salle, Ill.

#### Shelf Brackets.

Atlas Mfg. Co., New Haven, Conn.  
Stanley Works, New Britain, Conn.

#### Show Cases.

Union Show Case Co., Chicago, Ill.

#### Sinks.

Douglas, W. & B., Middletown, Conn.

#### Skates, Ice.

Dame, Stoddard & Kendall, Boston, Mass.  
Keene Mfg. Co., Keene, N. H.  
Winslow, Sam'l., Skate Mfg. Co., Worcester, Mass.

#### Skates, Roller.

Benley, M. C., Richmond, Ind.  
Union Hardware Co., Torrington, Ct.  
Winslow, Sam'l., Skate Mfg. Co., Worcester, Mass.

#### Slag Machines.

Cambria Iron Co., Johnstown, Pa.

#### Slaw Cutters.

Tucker & Dorsey Mfg. Co., Indianapolis, Ind.

#### Smelting Works.

Reeves, Paul S., 760 S. Broad, Phila.

#### Soldering Coppers.

Clendenin Bros., Baltimore, Md.  
Covert Mfg. Co., West Troy, N. Y.

#### Soldering Furnaces.

Burgess Soldering Furnace Co., Columbus, Ohio.

#### Speaking Tubes.

Ostrander, W. R. & Co., 204 Fulton St. N. Y.  
Wollensak, J. F., Chicago, Ill.

#### Spelter.

Mathlessen & Hegeler Zinc Co., La Salle, Ill.

#### Spoons and Forks.

Boardman, L. & Son, New Haddam, Conn.  
Holmes & Edwards Silver Co., Bridgeport, Conn.  
Rogers, The Wm. Mfg. Co., Hartford, Conn.

#### Sporting Goods.

Bartley & Graham, 313-315 B'way, N. Y.

#### Spring.

Clark & Cowles, Plainville, Ct.  
Coiled Wire Belting Co., Jersey City, N. J.  
Dunbar Bros., Bristol, Conn.  
Miller & Van Winkle, Brooklyn, N. Y.  
Morgan Spring Co., Worcester, Mass.  
Roland, Wm. & Harvey, Phila., Pa.  
Sabin Machine Co., Montpelier, Vt.  
Tuck Mfg. Co., Brockton, Mass.  
Washburn & Moen Mfg. Co., Worcester, Mass.  
Wolf, R. H. & Co., Ltd., 118th St. and Harlem River, N. Y.

#### Spring Hinges.

Bonner Bros., Brooklyn, N. Y.  
Fullman Sash Balance Co., Rochester, N. Y.  
Stover Mfg. Co., Freeport, Ill.  
Van Wagoner & Williams Hdw. Co., 14 Warren St., N. Y.

#### Stamping Works.

Avery Stamping Co., Cleveland, O.  
Cleveland Stamping & Tool Co., Cleveland, O.

#### Staples.

Cobb & Drew, Plymouth, Mass.  
Titchener, E. H. & Co., Binghamton, N. Y.

#### Steam Gauges.

Bristol Co., Waterbury, Conn.  
Star Brass Mfg. Co., Boston, Mass.

#### Steam Hammers, &c., Makers of.

Dienelt & Eisenhart, Philadelphia.  
Dudgeon, Richard, 24 Columbia Street, N. Y.  
Trethewey Mfg. Co., Pittsburgh, Pa.

#### Steam Heating & Oil Separators.

Webster, Warren & Co., Camden, N. J.

#### Steam Separators.

Harrison Safety Boiler Wks., Phila., Pa.  
Webster, Warren & Co., Camden, N. J.

#### Steam Specialties.

Lunkenhimer Co., Cincinnati, O.

#### Steel, Cold Rolled Strip.

Superior Steel Co., Pittsburgh, Pa.  
Wilnot & Hobbs Mfg. Co., Bridgeport, Conn.

#### Steel Figures and Alphabet.

Hoeft, C. W., 52 Fulton St., N. Y.  
Krogerud, W., 61 Fulton St., N. Y.

#### Steel Importers.

Abbott, Wheelock & Co., N. Y. and Boston.  
Hobson, Francis, Seaman & Co., 97 John St., N. Y.  
Jessop, Wm. & Sons, Sheffield, England, or 41 John, N. Y.  
Milne, A. & Co., Broadway, N. Y.  
Newton & Shipman, 83 John, N. Y.  
Wetherell Bros., 93 Liberty St., N. Y.  
Whitney, A. R. & Co., B'dway, N. Y.  
Wolf, R. H. & Co., Ltd., 118th Street and Harlem River, N. Y.

#### Steel (Mushet's Special).

Jones, B. M. & Co., Boston.

#### Steel Manufacturers.

Atna-Standard Iron & Steel Co., Bridgeport, O.  
Bethlehem Iron Co., S. Bethlehem, Pa.  
Baker, Hermann & Co., 103 Duane St. Carbon Steel Co., Pittsburgh, Pa.  
Chester Steel Castings Co., Phila., Pa.  
Chrome Steel Works, Brooklyn, N. Y.  
Crescent Steel Co., Pittsburgh, Pa.  
Frankford Steel Co., Philadelphia.  
Gautier Steel Department of Cambria Iron Co., Johnstown, Pa.  
Hobson, Francis, Seaman & Co., 97 John St., N. Y.  
Jessop, Wm. & Sons, Sheffield, England, or 41 John, N. Y.  
Kaiser, Ellison & Co., Sheffield, Eng.  
La Belle Steel Co., Pittsburgh, Pa.  
Lukens Iron & Steel Co., Coatesville, Pa.  
Morehead-McCleane Co., Pittsburgh, Pa.  
Moss, F. W., 83 John, N. Y.  
Pottsville Iron and Steel Co., Pottsville, Pa.  
Bowland, Wm. & Harvey, Frankford, Philadelphia.  
Singer, Nimick & Co., Pittsburgh.  
Superior Steel Co., Pittsburgh, Pa.  
Wordlaw, S. C., Sheffield, Eng.  
Wetherell Bros., 93 Liberty, N. Y.  
Wilnot & Hobbs Mfg. Co., Bridgeport, Conn.

#### Steel, Manufacturers' Agents.

Barns, C. K. & Co., Philadelphia, Pa.  
Butze, Adolph, St. Louis, Mo.  
Corning, Edw. & Co., 29 B'way, N. Y.  
Lindsay, Jas. G. & Co., Phila., Pa.  
Pierston & Co., 29 Broadway, N. Y.

#### Steel Rails, Manufacturers of.

Bethlehem Iron Co., S. Bethlehem, Pa.  
Cambria Iron Co., Johnstown, Pa.  
Montour Iron & Steel Co., Danville, Pa.  
Riverside Iron Wks., Wheeling, W. Va.

#### Steel, Tool.

Frankford Steel Co., Philadelphia, Pa.  
Jessop, Wm. & Sons, Sheffield, England, 41 John, N. Y.  
Jones, B. M. & Co., Boston, Mass.  
La Belle Steel Co., Pittsburgh, Pa.

#### Step Ladders, Rolling.

Bicycle Step Ladder Co., Chicago, Ill.  
Columbian Rolling Track Mfg. Co., Holyoke, Mass.  
Croissant, M., Albany, N. Y.

#### Stocks and Dies.

Armstrong Mfg. Co., Bridgeport, Conn.  
Billings & Spencer Co., Hartford, Conn.  
Butterfield & Co., Derby Line, Vt.  
Hart Mfg. Co., Cleveland, O.  
Oster Mfg. Co., Cleveland, O.  
Saunders Sons, D., Yonkers, N. Y.  
Wells Bros. & Co., Greenfield, Mass.  
Wiley & Russell Mfg. Co., Greenfield, Mass.

#### Stone Saws and Planers.

Lincoln Iron Works, Rutland, Vt.

#### Stove Linings.

Ostrander Fire Brick Co., Troy, N. Y.

#### Stove Pipe Thimbles.

Cheney, S. & Son, Manlius, N. Y.

#### Stove Trucks.

Gwinner Mfg. Co., Hamilton, Ohio.  
Randall & Ward, Le Roy, N. Y.  
Tucker & Dorsey Mfg. Co., Indianapolis, Ind.

#### Stoves, Gasoline.

Standard Lighting Co., Cleveland, O.

#### Street Lamps.

Rochester Lamp Co., 42 Park Place, New York.  
Steam Gauge & Lantern Co., Syracuse, N. Y.

#### Structural Iron Work.

Lindsay, Jas. G. & Co., Phila., Pa.

#### Sulphuric Acid.

Mathlessen & Hegeler Zinc Co., La Salle, Ill.

#### Tacks, Brads, Staples, &c.

Atlas Tack Corporation, Boston, Mass.  
Chess Bros., Pittsburgh, Pa.  
Clendenin Bros., Baltimore, Md.  
Cobb & Drew, Plymouth, Mass.  
Grand Crossing Tack Co., Grand Crossing, Ill.  
Shelton Co., Birmingham, Conn.

#### Tack and Nail Machinery.

Kimball Bros. & Co., Brockton, Mass.

#### Taps and Dies.

Butterfield & Co., Derby Line, Vt.  
Carpenter, J. M., Tap & Die Co., Pawtucket, R. I.  
Manning, Maxwell & Moore, 111 Liberty St., N. Y.  
Wells Bros. & Co., Greenfield, Mass.  
Wiley & Russell Mfg. Co., Greenfield, Mass.

#### Testing Laboratories.

Riehle Bros. Testing Mach. Co., Philadelphia.

#### Testing Machines.

Riehle Bros. Testing Mach. Co., Phila.

#### Theatrical Hardware.

Wollensak, J. F., Chicago, Ill.

#### Thill Springs.

Frost Thill Spring Co., Boston, Mass.  
Sabin Machine Co., Montpelier, Vt.

#### Thrust Collars.

Gouverneur Mach. Co., Gouverneur, N. Y.

#### Time Record.

Scattergood, H. W., Phila., Pa.

#### Tin Plate Machinery.

Lloyd Booth Co., Youngstown, Ohio.  
Phillips, F. R., Philadelphia, Pa.

#### Tire Upsetters.

Butts & Ordway, Boston, Mass.

#### Toe Calks, Steel.

Burke, P. F., Boston, Mass.

#### Tool Chests.

Am. Tool Co., 200 W. Houston St., N. Y.

#### Tool Holders.

Armstrong Bros. Tool Co., Chicago, Ill.

#### Tools.

Brown, R. H. & Co., New Haven, Conn.  
Mayhew, H. H. Co., Shelburne Falls, Mass.  
Millers Falls Co., 93 Reade, N. Y.  
Richardson, C. F. & Son, Athol, Mass.  
Standard Tool Co., Athol, Mass.  
Stanley Rule & Level Co., 29 Chambers, N. Y.  
Starratt, L. S., Athol, Mass.  
Stearns, E. C. & Co., Syracuse, N. Y.  
Stevens, J., Arms & Tool Co., Chicopee Falls, Mass.  
Tower & Lyon, 95 Chambers St., N. Y.

#### Tools, Blacksmith and Wheelwright.

Buffalo Forge Co., Buffalo, N. Y.  
Butts & Ordway, Boston, Mass.  
Champion Blower & Forge Co., Lancaster, Pa.  
Oster Mfg. Co., Cleveland, Ohio.  
Plumb, Fawcett R., Philadelphia, Pa.  
Wiley & Russell Mfg. Co., Greenfield, Mass.

#### Tools, Steam and Gas Fitters'.

Saunders Sons, D., Yonkers, N. Y.

#### Torches, Oil and Gasoline.

Dangler Stove & Mfg. Co., Cleveland, O.  
Schneider & Trenkamp Co., Cleveland, Ohio.  
Standard Lighting Co., Cleveland, O.

#### Tranrom Litters.

Wollensak, J. F., Chicago, Ill.

#### Trucks, Manufacturers of.

Clark, G. P., Windsor Locks, Conn.

#### Tubes, Seamless Drawn Copper.

Ansonia Brass & Copper Co., 19 and 21 Cliff, N. Y.  
Randolph & Clowes, Waterbury, Conn.

#### Tubes, Steel.

Avery Stamping Co., Cleveland, O.  
Leng's, John S. Son & Co., 4 Fletcher St., New York.  
Shelby Steel Tube Co., Shelby, Ohio.  
U. S. Projectile Co., Brooklyn, N. Y.

#### Tumbling Barrels.

Henderson Bros., Waterbury, Conn.

#### Turnbuckles.

Cleveland City Forge & Iron Co., Cleveland, O.  
Merrill Bros., Brooklyn, E. D.

#### Twist Drills, Makers of.

Cleveland Twist Drill Co., Cleveland.  
Morse Twist Drill & Machine Co., New Bedford, Mass.  
New Process Twist Drill Co., Taunton, Mass.  
Standard Tool Co., Cleveland.

#### Valves, Gas, Water and Steam.

Chapman Valve Mfg. Co., Boston.  
Eynon-Evans Mfg. Co., Philadelphia, Pa.  
Jenkins Bros., 71 John, N. Y.  
Lunkenhimer Co., Cincinnati, O.  
McNab & Harlin Mfg. Co., 56 John, N. Y.

#### Ventilating Fans.

Huyett & Smith Mfg. Co., Detroit, Mich.

#### Ventilator Appliances.

Howard & Morse, 10 Fulton St., N. Y.

#### Vise Jaws.

Newark Mch. Tool Co., Newark, N. J.

#### Vises.

Graham, John H. & Co., 113 Chambers Street, N. Y.  
Hollands Mfg. Co., Erie, Pa.  
Howard Iron Works, Buffalo, N. Y.  
Millers Falls Co., 93 Reade St., N. Y.  
Parker, Chas. Co., Meriden, Conn.  
Prentiss Vise Co., 44 Barclay, N. Y.  
Tower & Lyon, 95 Chambers St., N. Y.

#### Wagon Jacks.

Covert Mfg. Co., West Troy, N. Y.  
Covert's Saddlery Works, Farmer, N. Y.

#### Washboards.

Olds Wagon Wks., Ft. Wayne, Ind.

#### Washers.

Haskell, Wm. H. Co., Pawtucket, R. I.  
Milton Mfg. Co., Milton, Pa.  
Newbury, Jay Herbert, Guilderland, N. Y.  
Sternbergh, J. H. & Son, Reading, Pa.

#### Washing Machines.

Olds Wagon Wks., Ft. Wayne, Ind.  
Richmond Cedar Wks., Richmond, Va.

#### Water Meters.

Worthington, Henry R., 86 & 88 Liberty St., N. Y.

#### Water Wheels.

Poole, Robt. & Son Co., Baltimore, Md.

#### Wheelbarrows.

Bryan Mfg. Co., Bryan, Ohio.  
Sidney Steel Scraper Co., Sidney, O.  
Toledo Wheelbarrow Wks., Toledo, O.  
Withington & Cooley Mfg. Co., Jackson, Mich.

#### Window Cord, Makers of.

Samson Cordage Works, Boston, Mass.

#### Wire, Manufacturers of.

Gautier Steel Department of Cambria Iron Co., Johnstown, Pa.  
Miller & Van Winkle, Brooklyn, N. Y.  
New Castle Wire Nail Co., New Castle, Pa.  
New Haven Wire Mfg. Co., New Haven, Conn.  
Prentiss, Geo. W. & Co., Holyoke, Mass.  
Salem Wire Nail Co., Salem, O.  
Trenton Iron Co., Trenton, N. J.  
Washburn & Moen Mfg. Co., Worcester.  
Wetherell Bros., 93 Liberty St., N. Y.  
Wolf, R. H. & Co., Ltd., 118th St. and Harlem River, N. Y.  
Wright & Colton Wire Cloth Co., Worcester, Mass.

#### Wire Cloth.

Barnum, E. T., Detroit, Mich.  
Clinton Wire Cloth Co., Clinton, Mass.  
Darby, Edward & Sons, Philadelphia.  
Ester, W. S., 65 Fulton, N. Y.  
Gilbert & Bennett Mfg. Co., 42 Cliff.  
Howard & Morse, 45 Fulton, N. Y.  
Ludlow-Saylor Wire Co., St. Louis, Mo.  
N. J. Wire Cloth Co., Trenton, N. J.  
Scheeler & Sons, Buffalo, N. Y.  
Wickwire Bros., Cortland, N. Y.  
Wright & Colton Wire Cloth Co., Worcester, Mass.  
W. S. Tyler Wire Works Co., Cleve'd.

#### Wire Cutters.

King, J. M. & Co., Watertown, N. Y.

#### Wire Dies.

McFarland, Wm., Trenton, N. J.  
Newton & Shipman, 83 John St., N. Y.

#### Wire Fences, See Fencing, Iron and Wire.

#### Wire Goods, Manufacturers of.

Bromwell Brush & Wire Goods Co., Cincinnati, Ohio.  
Darby, Edward & Sons, Phila.  
Gilbert & Bennett Mfg. Co., 42 Cliff St., N. Y.  
Ludlow-Saylor Wire Co., St. Louis.  
Ossawa Mills Co., Norwich, Conn.  
Scheeler & Sons, Buffalo, N. Y.  
Wickwire Bros., Cortland, N. Y.  
Williamson, C. T., Wire Novelty Co., Newark, N. J.  
Wire Goods Co., Worcester, Mass.

#### Wire Machinery.

Am. Tool Wks., Cleveland, O.  
Manville, E. J. Mch. Co., Waterbury, Ct.  
Morgan Construction Co., Worcester, Mass.  
Waterbury Mch. Co., Waterbury, Conn.

#### Wire Straightening and Cutting Machinery.

Adt, John & Son, New Haven, Conn.

#### Wire Nails.

Bond Nail Co., Raynham, Mass.  
Indiana Wire Fence Co., Crawfordsville, Ind.  
Kilmer Mfg. Co., Newburg, N. Y.  
New Castle Wire Nail Co., New Castle, Pa.  
Phillips, Townsend & Co., Phila., Pa.  
Salem Wire Nail Co., Salem, O.  
Taunton Wire Nail Co., Taunton, Mass.  
Whitney, A. R. & Co., New York City.

#### Wire Rods, Steel.

New Castle Wire Nail Co., New Castle, Pa.  
Washburn & Moen Mfg. Co., Worcester, Mass.  
Whitney, A. R. & Co., 17 B'way, N. Y.  
Wolf, R. H. & Co., Ltd., 118th Street and Harlem River, N. Y.

#### Wire Rope, Iron and Steel, Makers.

Broderick & Bascom Rope Co., St. Louis, Mo.  
California Wire Works, San Francisco.  
Hazard Mfg. Co., Wilkesbarre, Pa.  
A. Leschen & Sons Rope Co., St. Louis.  
Trenton Iron Co., Trenton, N. J.  
Washburn & Moen Mfg. Co., Worcester, Mass.

#### Wire Rope Machinery.

Kay, J. F., Passaic, N. J.

#### Wood Turning.

Cleveland Wood Turning Co., Cleveland, O.

#### Wood-Working Machinery.

Egan Co., Cincinnati, Ohio.  
Seneca Falls Mfg. Co., Seneca Falls, N. Y.

#### Wrenches, Manufacturers

Bemis & Call Hardware & Tool Co., Springfield, Mass.  
Billings, Spencer & Co., Hartford, Conn.  
Coxes Wrench Co., Worcester, Mass.  
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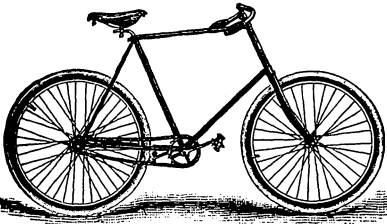
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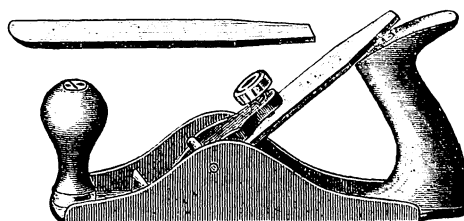
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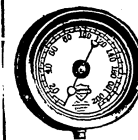
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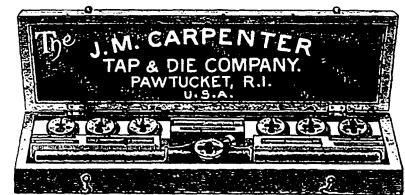
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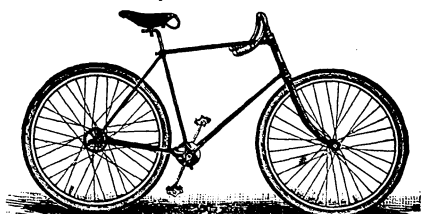
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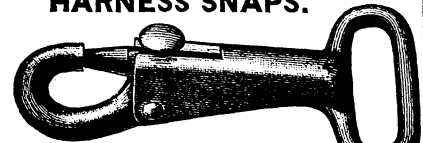
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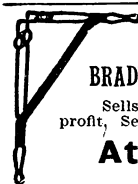
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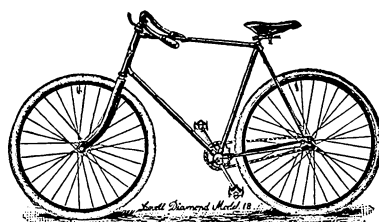
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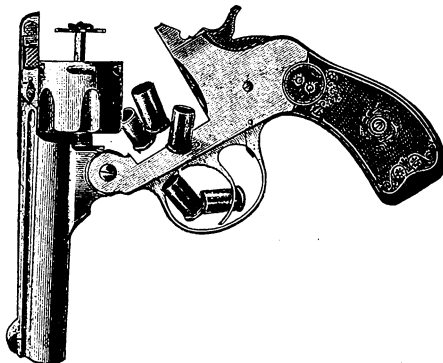
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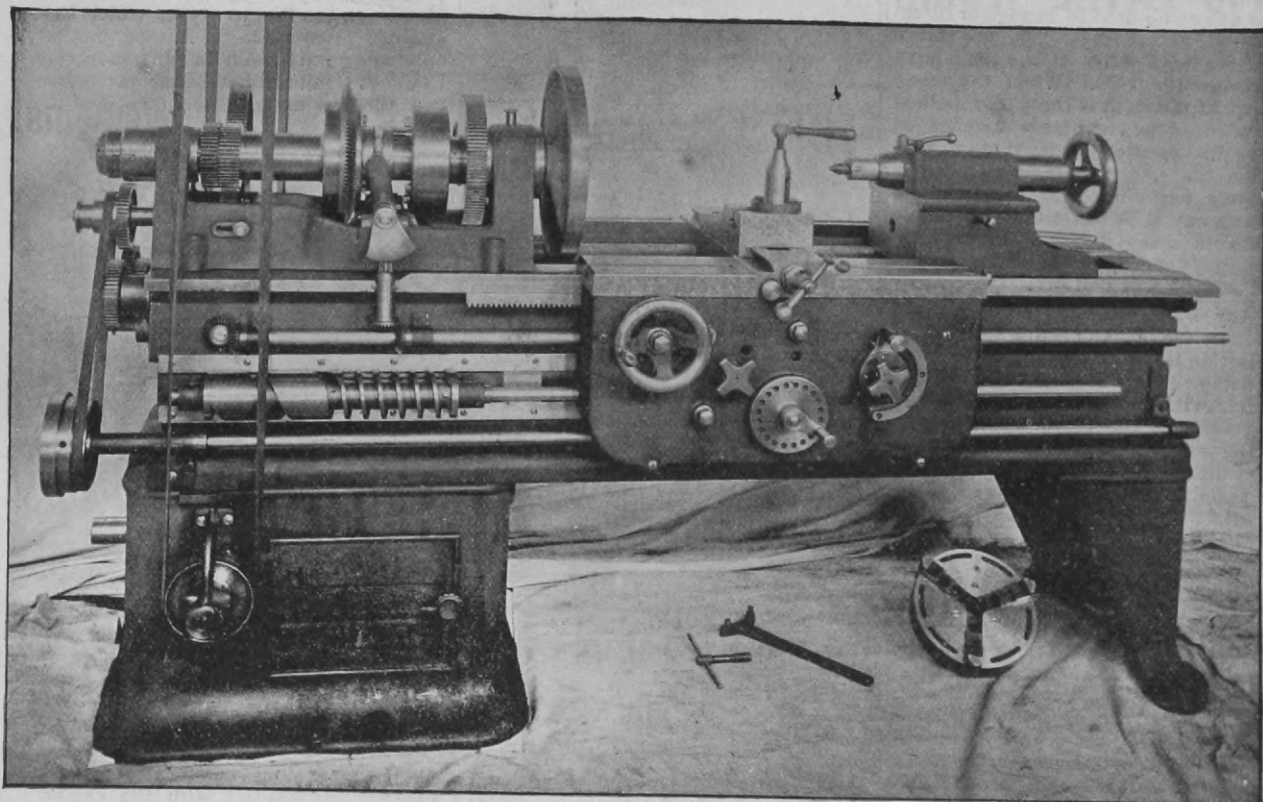
The general dimensions of the engine are as follows: Cylinder, 22 x 28 inches; drivers, 62 inches diameter, all flanged; gauge of track, 4 feet 9 inches; fuel, lump anthracite; wheel base, engine, 22 feet 5 inches; driving wheel base, 14 feet; wheel base of tender, 11 feet 6

nals 9 inches diameter and 12 inches long. Driving boxes of steeled cast iron, with Ajax bearings. Side rods of steel, oil cups forged on. Tender, 6-wheeled, wrought iron, steel tired wheels, 42 inches diameter; brakes on all wheels. Janney coupler on tank. National hollow brake beams. Capacity of tank, 4000 gallons. Tender axles, steel, journals  $6\frac{1}{4}$  inches diameter, 10 inches long.

The materials selected for these engines has been the best to be had, the design presenting some new features, and the size and weight going beyond any precedent. They were intended to pull coal trains from Roan, the central point on this road, to Perth Amboy,

## Child's Automatic Rapid Lathe.

Child's automatic speed regulating lathe, made by the Automatic Rapid Lathe Company of 131 Summer street, Boston, is so designed that when the tool is moved toward or from the center the revolutions are increased or decreased, as required, automatically. In squaring up disks, or any work requiring the cross feed (either hand or power), the cutting speed at which the work is started is maintained to the center automatically. Another feature of this speed varying device is that, in turning shafting or any work of like nature, every movement of the tool to-



CHILD'S AUTOMATIC RAPID LATHE.

inches; total length of engine and tender, 62 feet 7 inches; weight, total, 151,000 pounds; weight on drivers, 136,000 pounds; weight of tender (loaded), 90,000 pounds. Boiler, made throughout of flange plates, homogeneous cast steel  $\frac{3}{8}$  inch thick; 72 inches diameter at smallest ring; straight; longitudinal seams butt jointed with double welt strips; all rivets hand driven, button set; dome placed in center; pressure 160 pounds per square inch. Tubes, 270, of iron 13 wire gauge, 12 feet long,  $2\frac{1}{4}$  inches diameter.

Fire box,  $132\frac{1}{16}$  inches long, 42 inches wide inside, 3-inch water space on sides, 4 inches back and front; two-wheeled engine truck has 36 inch steel tired wrought iron wheels, with journals 6 inches diameter and 12 inches long; slide valves, Richardson balanced. All drivers are flanged with  $5\frac{1}{2}$  inch tread Krupp crucible steel tires, 3 inches thick. Axles, steel, with jour-

N. J., over the Lehigh Valley road. There was a misunderstanding about this arrangement, as the bridges of the L. V. were not ready to stand such heavy engines, and the L. V. R. R. bought six of the engines and have them in heavy freight service on the northern division of the road. The four in service on the D. S. & S. are each handling two of the trains formerly hauled by the old 19 x 24 moguls.

Some anxiety was felt as to their effect on the track, as the rails are only 60 pounds per yard, but the road department say they can see no difference.

A considerable amount of the export business of the Southern Railroad will go by way of Newport News, Va., through a special traffic arrangement with the Chesapeake & Ohio. This move will add greatly to the commercial importance of this rising port.

ward the center (as in starting a new cut) gives a corresponding increase in the number of revolutions; as, for instance, on the ordinary lathe, if the operator should be turning a piece 2 inches in diameter and a part of the work is required to be turned to 1 inch he would never think of changing the number of revolutions in order to keep the cutting speed constant. With this device, for each cut taken the revolutions would be increased, until at 1 inch diameter they would be doubled, as required. In the ordinary lathe there are certain fixed changes of speed, and the immediate points between the different steps cannot be reached. With this lathe the revolutions can be varied to any point within the range of the lathe, which in the present design is from 10 to 210 revolutions.

The back gears are thrown in or out by a lever shown at the right hand of the apron and just above the carriage.



By this arrangement the operator can instantly engage or disengage the back gears, which on many kinds of work has to be done very often. The lead screw is placed under the inside projecting edge of the bed in such a way as to make it impossible for dirt to reach it, and in such a position as to be directly under the tool, thus avoiding the twisting pull on the carriage that occurs where the lead screw is placed either at the back or front. The nut is thrown in by the knob shown at the left of the cross feed screw.

This construction also admits of making a much larger hollow spindle than can be used on the ordinary lathe. In the present lathe, which swings 16 inches, this spindle is  $3\frac{1}{4}$  inches in diameter in the main bearing and has a 2-inch hole through it. The arrangement of the feeds is such that no two can become engaged at once. At the right of the apron is a crank with index pin, which in the position shown gives the feed lengthwise the lathe by tightening the nut shown under the crank, this nut being used to engage or disengage all of the feeds. The nut shown near the hand wheel at the left is used to reverse the feeds. When the crank shown at the right is thrown to its lowest position the cross feeds are engaged and the parallel feeds thrown out. When the crank is thrown to its intermediate position all of the feeds are thrown out, thus obviating the trouble found in many lathes of the feed becoming engaged while cutting screws and causing a breakdown.

Any adjustment of speed may be made by the operator while standing in a position to see exactly what the tool is doing. This is accomplished by withdrawing the index pin shown in the crank at the center of the apron (under which is a disk with a series of holes drilled in its face) and revolving the same until the desired speed is attained.

The speed changing mechanism, shown in plan in Fig. 2, is contained in the cabinet leg of the lathe. The pulleys D and D' are the same as those to which the belt leads on opposite sides of the leg, as shown in the perspective view. The method of driving from the countershaft is as follows: The belt, after passing around the pulley D, is carried over a pulley which is fast to the countershaft, thence down on opposite side of lathe, around pulley D', thence over a pulley running loose on the countershaft and down to pulley D on the machine, making a single belt drive both pulleys in opposite directions, as required. If it should be found desirable to place the lathe at right angles to the countershaft, or main shaft, it can be done by making both pulleys fast to the countershaft and using two belts, one open and the other crossed. It can readily be seen that this arrangement of belts would be a great advantage in many cases. The pulleys D and D' have formed on each side a long hub, fitted to run in brackets, bolted to the side of the leg. The hubs of the pulleys D and D' are fitted to receive the splined shafts, which carry at their inner ends the friction wheels B and B', the shafts being fitted to slide endwise, thereby carrying the friction wheels to or from the center of the disks  $a$  and  $a'$ . The distance of the friction wheels from the center of  $a$  and  $a'$  is governed by a forked arm (not shown), which is moved from a direct connection with the cross feed screw and engages the grooves formed in the hubs of B and B'. The disks  $a$  and  $a'$  are leather faced,  $a$  being fast to

shaft C, while  $a'$  is fitted to run loose on the same shaft. The disk  $a'$  has a hub formed to receive the hub of the bevel pinion E, to which it is splined in such a way as to allow a free end movement of the disk, while the pinion E is held in its proper position by the shouldered bearing shown underneath the bevel gear P, with which the pinion E meshes.

Splined to the shaft C and in mesh with the bevel gear P is a bevel pinion  $o$  having a hub formed to run in a bearing attached to the leg of the machine.

The outer end of the shaft C is supported in a flanged bearing bolted to the leg (seen below the feed pulley in the perspective view). The disks  $a$  and  $a'$  are pressed against the faces of the friction wheels B and B' by the collar

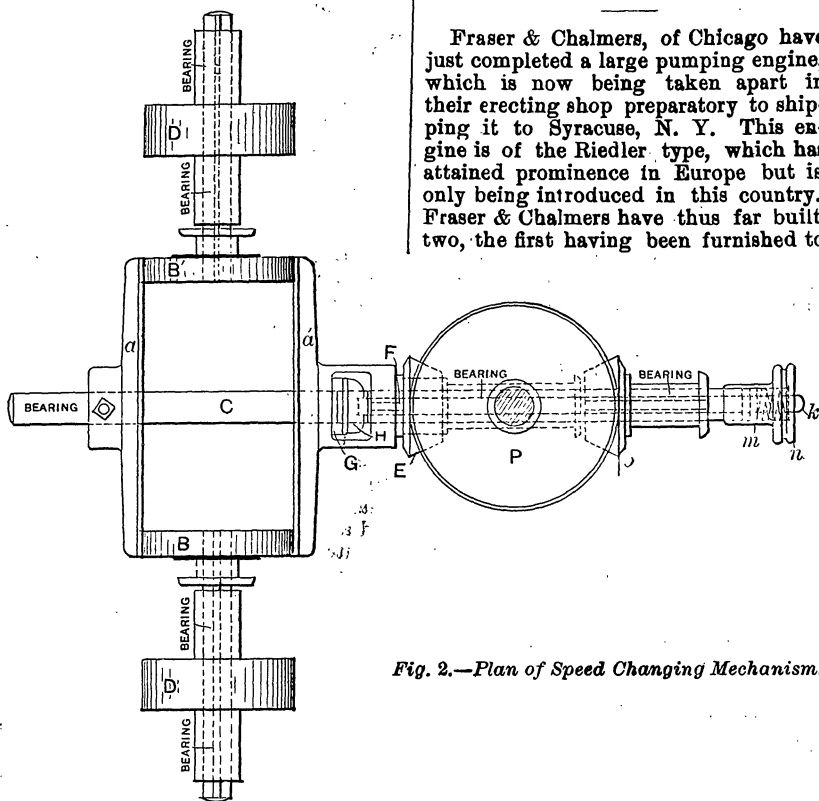


Fig. 2.—Plan of Speed Changing Mechanism..

#### CHILD'S AUTOMATIC RAPID LATHE.

G. The key H fits in a slot cut through the shaft. A hole is bored in the center of the shaft C, in which fits the spindle  $k$ , its end resting against the key H. The spindle  $k$  has formed near its outer end a collar against which rests the coiled spring  $m$ . Encircling the spring  $m$  and spindle  $k$  is the nut  $n$ , threaded to the end of the shaft and designed to press against the spring, and thereby through the spindle  $k$ , key H, collar G (collar G being designed to use the hardened steel balls not shown) a pressure is exerted to hold the disks  $a$  and  $a'$  to the faces of the friction wheels B and B'.

The bevel gear P through its shaft (shown in section) transmits the driving power from the speed varying device in the leg to large bevel gear shown on the spindle in place of the usual cone pulley.

It will be seen by the foregoing that whatever pressure is applied to the friction wheels from the disk at one side reacts through the mechanism employed to exactly the same amount upon the opposite disk, thereby obviating any side or twisting strains found in other forms of friction driving devices.

The nut  $n$  is knurled and made a convenient size to grasp with the hand. A very light tension applied in this way serves to give ample power for the heaviest cuts.

Hatch & Wickes, as attorneys for Frank M. Clute, assignee of Lucius Hart & Co., have brought an action against the New York Smelting & Refining Company of New Jersey for a dissolution of that company, for a liquidation of their affairs and for an accounting by William S. Davol and Charles C. Pomeroy, as trustees for the creditors of the New York Smelting & Refining Company of New York. Lazarus Lissberger, Bernard Schutz, Frances Lissberger and Post, Martin & Co. are also named as defendants.

Fraser & Chalmers, of Chicago have just completed a large pumping engine, which is now being taken apart in their erecting shop preparatory to shipping it to Syracuse, N. Y. This engine is of the Riedler type, which has attained prominence in Europe but is only being introduced in this country. Fraser & Chalmers have thus far built two, the first having been furnished to

the Boston & Montana mine in Montana, where it lifts 600 feet with the engine running at 90 revolutions. The Boston and Montana pump has differential plungers and the whole pump mechanism is made of bronze to resist the action of the mine water. It has proved itself much more efficient than the Cornish system of pumping from deep levels, while costing only a fraction as much. The Syracuse pump has double acting 15 $\frac{1}{4}$ -inch plungers. The water valves are quadruple ring. They are opened by the flow of the water and closed by power. This engine is compound, with 22 and 36 x 42 inch steam cylinders, thus giving a 42-inch stroke. It is designed to run at 70 revolutions and to discharge 15,000,000 gallons in 24 hours.

F. W. Wheeler & Co., ship and engine builders, West Bay City, Mich., have just received a contract for the building of a steamer of which the principal dimensions are as follows: Length over all, 370 feet 6 inches; length between perpendiculars, 352 feet; beam, molded, 44 feet 6 inches; beam extreme, 44 feet 8 inches; depth molded,

26 feet 3 inches. The engine will be of their own make, triple expansion, cylinders 20, 32½ and 55 x 42 inch stroke. Steam will be supplied by two return tubular boilers 13 feet 6 inches diameter by 12 feet long, at a pressure of 170 pounds per square inch. The main frames will be of angle bulbs. Sheer strake and upper deck stringers will be very heavy, double butt strapped and treble riveted with 1-inch steel rivets. The water bottom will be constructed on the cellular type with four longitudinal girders on each side of center vertical keelson. This water bottom will be 54 inches deep with a capacity of 1500 tons water ballast. She will have ten hatches 30 feet wide by 8 feet long. Intermediate frames will be fitted forward of collision bulkhead as a protection against ice. The cabins will be of the usual steam barge type. She will be supplied with steam steerer, steam capstan and windlass; patent stockless anchors, &c. She will be neatly fitted out and will be thoroughly first-class in every respect.

### Most Economical Temperature for Steam Engine Cylinders.

A paper dealing with the important question of the most suitable temperature of cylinder walls to obtain the maximum economy by reducing condensation to a minimum was presented by Bryan Donkin at the meeting of the British Association.

To diminish condensation his experiments prove that it is essential to reduce the difference of temperature between the incoming steam and the cylinder walls. In most cases the cylinder walls are much colder than the steam, and often one-half the weight of steam is condensed during admission. Many experiments show that the nearer the temperature of the cylinder wall is to that of the entering steam the greater is the economy. With walls 40° to 60° F. colder than the steam, as is often the case, the consumption is greatly increased, owing to the large amount of condensation. On the other hand, the cylinder metal can be made too hot and heat wasted at exhaust. This has also been experimentally proved by the author. The best results in steam economy have been obtained when the temperature of the internal surfaces is a little higher than that of the entering steam. Cylinder walls can be heated in various ways. The most usual is to raise their temperature and that of the covers, by means of boiler steam introduced into the jacket spaces. Another method, and one used a good deal on the Continent, is to work with superheated steam. This steam has been employed in some cases with advantage in the jackets as well as in the cylinders. Smoke jackets have generally proved a failure. When the jacket is connected to a condenser having a good vacuum, economy of steam is also obtained, but not so much as with steam in the jackets. To secure the maximum economy also, it is important not only to diminish the volume of the clearance spaces, but especially to reduce as much as possible the area of the clearance boundary surfaces. In this way the weight of iron heated and cooled per stroke so many degrees can be materially diminished. The character of the internal surfaces, whether rough from the sand or turned, and their position, horizontal or vertical, have also some influence on

the transmission of heat and condensation of steam, as verified by recent trials. Experiments have also shown that the cylinder wall in any working steam engine is divided thermally into two parts; the outer portion remains at a constant temperature and the inner or periodic portion is heated with each steam and cooled with each exhaust stroke. The relative proportion of these two parts, or the depth to which the heat penetrates into the metal, depends largely upon the speed of the engine and on the temperature of the cylinder relatively to that of the entering steam. In the non-jacketed engine, with 1-inch cylinder walls, working at 35 revolutions per minute, the depth to which the heat penetrates and fluctuates per stroke is at least about 8 to 9 mm. from the internal surface. The depth of heat penetration for the same speed is much less with hot than with cold walls; a less weight of metal is heated per stroke, and condensation is found to be much reduced.

The author gives some of the results of 80 experiments on a small vertical engine, with cylinder 6 inches diameter and 8-inch stroke, made expressly for experimental research. The engine was worked with very different temperatures of walls, and many tests were made, condensing and non-condensing, jacketed and non-jacketed, single and double-acting at different expansions, and with both saturated and superheated steam in the cylinder and jackets. Care was taken in these experiments only to vary one set of conditions at a time. Results of two experiments are added, one with hot and the other with cold walls, or one with steam and the other with air in the jackets. Both tests were made condensing, double acting, with 50 pounds steam pressure, three-sixteenths cut off, and at a speed of 220 revolutions per minute. The walls were some 30° F. hotter with than without steam in the jackets; the steam consumption per indicated horse power hour was reduced from 41½ pounds to 28½ pounds, or about 31 per cent.; the thermal efficiency was increased from 5.7 to 8.1 per cent., or 40 per cent.; and the rate of initial condensation was reduced from 460 pounds to 217 pounds per square foot per hour, or by more than one half. The percentage of steam present in the mixture during expansion was also increased by about 50 per cent. Throughout these experiments an increase of economy with the hotter walls was always verified; the thermal efficiency was higher, the initial condensation less, and the percentage of steam present during expansion always increased.

The tests on this engine point to the practical conclusion that the range of steam temperature in the cylinder per stroke has much less effect on the steam consumption than the temperature of the walls. The results may be shortly summarized thus: The most uneconomical results were always obtained with the cylinder walls colder than the entering steam. Under these conditions considerable initial condensation was produced, drops of all sizes up to 3 mm. diameter being formed and running down the cold surfaces. The heat also penetrated into the colder walls to a considerable depth, a certain quantity being given up by the steam at every stroke, to raise the temperature of the internal surfaces after exposure to the condenser temperature. Both at cut off and release there was a great deal of water in the cylinder compared with the weight of steam present. On the other hand, the most economical results

were always obtained when the cylinder walls were at about the same temperature as that of the entering steam. Under these conditions the rate of initial condensation was very much lower, and the drops of water formed much smaller in size. The heat penetration into the walls was also much less, a smaller amount of steam sufficing to heat the internal surfaces after being cooled by the condenser. The percentage of steam present in the mixture at cut off and release was also very much increased. If engineers and others using steam engines wish to work economically and with smaller boilers, they must arrange to keep their boilers and covers as hot as the steam entering the cylinder, otherwise the cylinder becomes unintentionally an efficient condenser with a large area of cooling surface. Properly applied steam jackets are economical, because they raise the temperature of the walls touched by the steam. Those who cannot steam jacket the whole cylinder should at least jacket the two covers, which are the most important surfaces. Well arranged jackets with properly sized pipes for entering steam and exit water, without places for air to collect, are an excellent investment, and pay a good interest on the small additional cost.

### A Telescoped Cupola.

An accident that happens not very often to foundrymen occurred recently at the works of the Radford Pipe & Foundry Company at Radford, Va.—namely, the telescoping of one of their large cupolas. Perhaps owing to faulty construction, this cupola spread at the charging door section, allowing the stack to drop something like 5 feet. The problem then was, how to restore the cupola to its original position without accident and without removing the lining and taking the cupola down section by section. This was expeditiously accomplished by first lashing the cupola at the top to the main building of the pipe foundry; then large cast iron shoes were bolted to the shell just above the roof of the cupola house, and these in turn were bolted to long timbers 12 x 12, which were securely blocked and wedged into position as the cupola was straightened back into place by the use of chains and turnbuckles. As soon as in position the under sections were taken away, leaving the stack in mid-air securely lashed to the building and supported by timbers and castings just described. The roof of the cupola house was strengthened in the mean time by heavy timbers running from the ground to the cupola loft and thence underneath the roof. As the lower part of the old cupola was somewhat worn, and a new one of larger size desired, a new 96-inch Whiting cupola was erected in place of the old, and joined to the stack which had been held in place. The employees having the job in charge were very much pleased and gratified at the successful completion of the rather delicate work they had undertaken.

An interesting device for saving labor has been invented by Secretary H. M. Capp of the West End Rolling Mill Chain Works, Lebanon, Pa., for the purpose of unloading coke. It consists of a "carrier," which extends from the railroad track to the coke crusher. The coke can be shoveled directly from the car into the "carrier," which conveys it to the crusher, emptying it in with-

out further expenditure of labor. By this means Mr. Capp estimates that at least \$3 or \$4 per day is saved. The old method was to unload the coke from the cars into carts and haul it to the crusher. The new device is a very neat way to save this extra labor. It is run by steam.

### Method of Operating Electric Motors.

Letters patent were recently issued to J. Sellers Bancroft for a method of operating electric motors. The patent has been assigned to Wm. Sellers & Co., Incorporated, of Philadelphia, by whom the method has been used most successfully. In the introduction to the patent it is stated that where several electric motors, receiving their current from a common source of supply, are to be operated from one point by one operator, it has hitherto been customary to use series wound motors and to employ rheostats for admitting the current in sufficiently limited quantity for the purpose of starting, the speed of rotation of the motor being determined by the resistance of the load, or by choking the current through a rheostat, a large part of the energy of the current being wasted in heating this rheostat. For many purposes it is desirable to have the motors run at comparatively slow speeds for considerable time, in which case the electric energy wasted through the rheostat is very considerable and the temperature becomes so high that there is great danger of destroying the rheostat. For purposes where it may be desirable to operate the motors at slow speed for considerable time the shunt form of motor is preferable. It is explained that by the shunt motor the inventor means a motor having its field partially or wholly energized by a current that does not pass through the armature coils, and that may be supplied from a different source from that which supplies the armature current, by changing the connection on the ordinary commercial shunt motor, the field coils receiving a current from a source of constant potential and the armature being supplied by a current, the potential of which may be varied, so that as the potential is lowered the speed of the motor is reduced without diminishing its torque for any given load. This has, previous to the present invention, required that the armature of each motor should be supplied with current by its own special generator, but when several motors were required to be operated in one group the expense of these special generators has been almost prohibitory. An object of the invention is to provide a means of operating the armatures of two or more motors from one generator, and further to provide means whereby any of the motors may be started or stopped or reversed without interfering with the running of others of the group. Means are also provided for exciting the fields of the motors before current can be admitted to their armatures. Provision is also made for reducing the intensity of the motor fields in order to increase the motor speed above the normal one for light loads. To accomplish these ends the invention consists of a generator and two or more motors whose fields are energized by a circuit separate from their armature circuits and means for connecting the armature circuits of any or all the motors with the armature circuit of the generator, whereby the

potential of the current supplied to each motor armature can be varied separately. Provision is made for interlocking the switch for supplying current to the generator field with the switch for supplying current to the motor field, so that the generator field cannot receive current until current has been supplied to the motor field and so that current cannot be cut off from the motor field until after it has been cut off from the generator field.

A rheostat switch is provided for admitting current to the motor field whereby the current may be gradually cut off so as to diminish the induced current on breaking the field circuit and thus lessen the danger of breaking down the field insulation.

In the accompanying drawings Fig. 1 shows an arrangement for operating two or more motors, in which one motor armature is shown ready to run forward, another ready to run backward

motor if the current is in the mains and the other motors are running. R, Fig. 1, is a rheostat which admits, modifies or cuts off the current from the generator A to the field coils of the generator B, and by which the voltage of the current produced by the armature of the generator B is varied from the maximum to zero.

S is a switch which cuts off the current supplied from the generator A and is so placed that when this switch is closed by moving the operating lever S R to the left, see Fig. 1, the current is admitted to the fields of the motors M', M<sup>2</sup> and M<sup>3</sup> and further movement of the lever S R to the left admits current to the rheostat R that regulates the field of the generator B, and as the generator B can supply no current unless its field is excited, it will hence be impossible to send a current through the armature of the motors until current has been admitted to their fields. It is de-

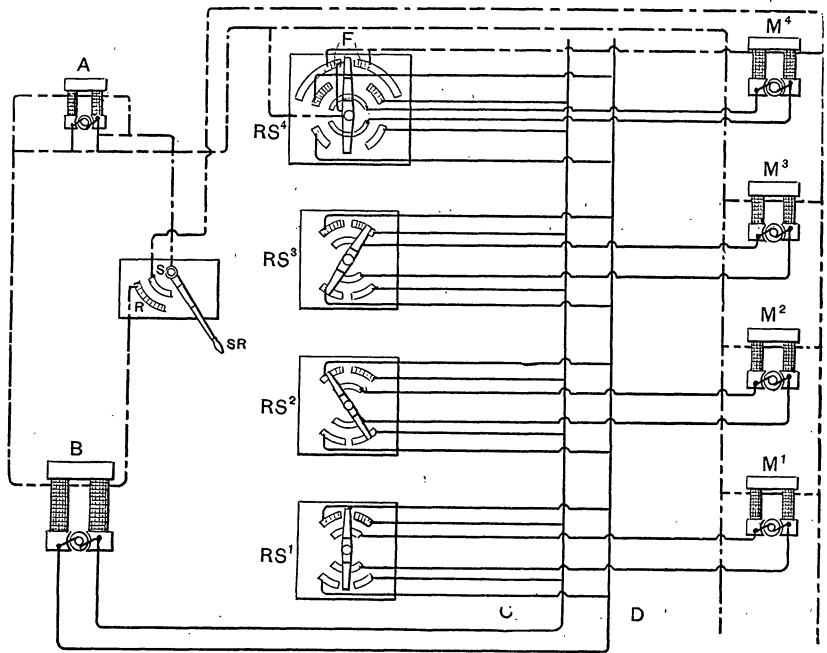


Fig. 1.—Operating Two or More Motors.

### METHOD OF OPERATING ELECTRIC MOTORS.

and another ready to be started in either direction. Fig. 2 is a plan view of an interlocking arrangement of a rheostat switch for the generator field and a rheostat switch for the motor fields. Fig. 4 shows another method of interlocking the switch levers.

A represents a shunt or compound generator adapted to supply current of constant potential to the field of the generator B and to the fields of the motors M', M<sup>2</sup>, M<sup>3</sup>, &c. B is a larger generator of the shunt or compound type of winding, but without any connection between the field shunt coils and armature coils. M', M<sup>2</sup>, M<sup>3</sup>, &c., represent motors of the shunt type, the shunt coils being supplied by the generator A and having no electrical connection with the armature circuits, which are supplied with current from the armature of the generator B. R S', R S², R S³, &c., are reversing rheostat switches, by which the direction of flow of current in the armature coils of the motor to which they are individually coupled may be reversed and through the rheostat coil of which the current may be gradually admitted or cut off, to start or reduce the speed, or to stop the

sirable to provide the switch that cuts off the current from the motor fields with a rheostat, whereby the flow can be gradually reduced, and so greatly diminish the induced current at final breaking. It is also desirable to arrange the field switch for the motors so that these fields can be weakened to a predetermined extent in order to increase the motor speeds for light loads. It is therefore preferable to interlock these two switches.

This is accomplished in the following way:

R', Fig. 2, represents the lever for operating the rheostat R for the generator field. This lever is pivoted at R³ to the base plate R⁵. R² represents the successive blocks, through contact with which the amount of resistance is varied, the lever R' being in its extreme position to the right contact is broken and no current flows; the broken line R³ R⁴ represents its extreme position to the left, when the resistance is cut out and full current flows.

S' represents the lever for admitting current to the motor fields, and is shown pivoted at S³ to the base plate R⁵, S² being the series of rheostat

blocks through which the motor field current is gradually admitted or cut off. This lever  $S^1$ , when all current is cut off, stands in the position shown by the broken line  $S^2$ , and when the resistance of the rheostat is cut out and full current passes to the motor fields it stands in the position of the line  $S^3$ . The bar  $E$  slides in suitable guides, as shown, and is coupled by the connecting rod  $E^1$  to the lever  $R^1$ , so as to slide back and forth in its guides as the lever  $R^1$  is moved. The lever  $S^1$  has formed with or secured to it the segment  $E^2$ , which engages in a groove,  $E^3$ , formed in the bar  $E$ , so that the bar and consequently the lever  $R^1$  cannot

the rheostat  $S^2$  and the length of the segment  $E^2$ , of putting a certain resistance in the field circuit, and thereby weaken the field coils of the motors to a predetermined amount, and thus to have the ability to increase their speed above the normal, when working with light loads. By placing the levers  $R^1$  and  $S^1$  as shown in Fig. 3 the bar  $E$  may be omitted, the projections from the levers forming the interlock. If there is no necessity for weakening the fields of the motors to increase their speed of rotation, then the two switches may be interlocked by combining them on one lever so that the first part of the motion will gradually introduce the

rent to the rheostat  $R$ . Suppose, for example, that the rheostat switch  $R S^2$  is now moved so as to connect the motor  $M^2$  with the mains  $C$  and  $D$ , connecting the positive wire with the right hand brush, and that the rheostat switch  $R S^3$  is moved, say, in the opposite direction to couple the motor  $M^2$  with the mains, the right hand brush being connected with the negative wire. The motors  $M^2$  and  $M^3$  would now be ready to run, but in opposite directions, as soon as they receive current through their armatures. This is accomplished by moving the lever  $S R$  of the rheostat  $R$  in Fig. 1, which admits current from the generator  $A$  to the field coils of the generator  $B$ , first through the full resistance of the rheostat  $R$ , and thus slightly magnetizes the field coils. The armature will now begin to produce a current of low voltage, which, passing through the armatures of the motors  $M^2$  and  $M^3$ , will produce slow rotation in opposite directions. As the rheostat  $R$  is moved to reduce its resistance, the amount of current flowing through the generator field coils increases, the voltage of the produced current rises, and the motors increase their speed and attain their maximum when the rheostat  $R$  is moved so as to allow the full current to flow through the field coils. If it is now desired to start the motor  $M^1$  or any succeeding one in the group, the corresponding rheostat switch is moved to the right or left, depending on the direction of rotation required, and current from the mains  $C D$  is thus admitted to the motor armature, producing rotation, which is gradually accelerated as the resistance of the rheostat is cut out, until the motor attains the full speed due to the potential existing at the time in the mains. If it is desired to stop any motor of the series, the rheostat switch of that motor is turned toward its central position, so as to gradually introduce more and more resistance, cutting down the potential of the current at the motor brushes and slowing the motor until the current is cut off.

It will be seen that when the system is at rest and it is desired to start any motors, the rheostat switches are then moved promptly to their full extent in either direction, according to the direction of rotation required, and then act as ordinary switches, being moved before the current is admitted, and if it is never desired to start any motor while the other motors are running the rheostat can be omitted and plain reversing switches used. It will be seen that this arrangement has the advantage of running one or more motors at any speed for any length of time and with an expenditure of energy in proportion to the useful work done, the number of speeds that can be obtained depending upon the number of steps in the generator rheostat. It also admits of any motors being added to or taken from the running group without any interference with the others, and thus enables any machinery requiring a group of motors to drive its various movements to be operated to the best advantage and the greatest economy of both installation and operation. If the number of motors to be operated by this system is very large it may be necessary to provide additional switches so that the current may be turned into the fields of only those motors that it is desired to run, in order to reduce the amount of current consumed.

Bonds to the amount of \$500,000 have been voted by the city authorities for sewer construction at San Antonio, Texas.

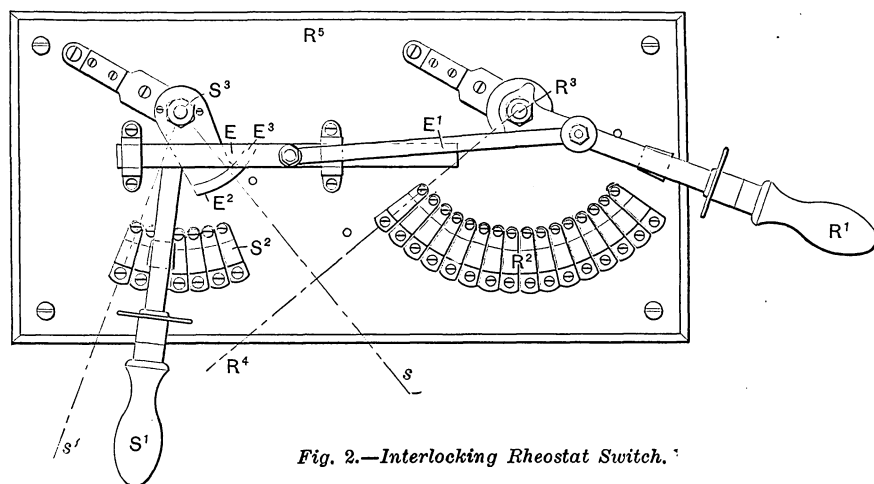


Fig. 2.—Interlocking Rheostat Switch.

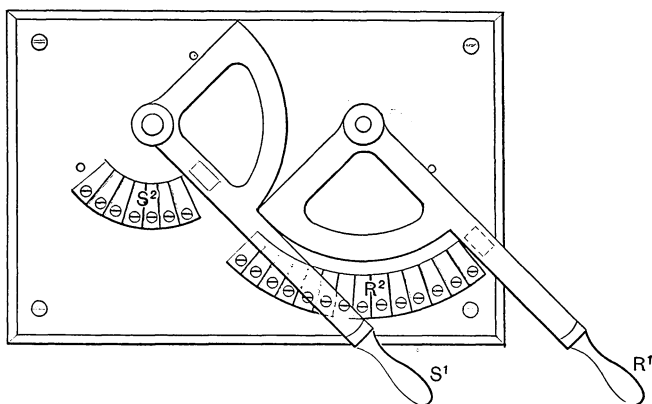


Fig. 3.—Another Method of Interlocking the Switch Levers.

#### METHOD OF OPERATING ELECTRIC MOTORS.

be moved until the lever  $S^1$  has been moved far enough to the left to draw the segment  $E^2$  out of the groove  $E^3$  in the position shown in the drawings. When this has been done current will have been admitted to the motor fields through the rheostat  $S^2$ . The lever  $R^1$  can now be moved toward the left to gradually admit current to the field coils of the generator, but it will be observed that when the lever  $R^1$  has been moved so as to admit current through the first block of the rheostat  $R^2$ , the groove  $E^3$  no longer corresponds with the path of the segment  $E^2$ , and that the lever  $S^1$  cannot be moved back and that current cannot be cut off from the motor fields until the lever  $R^1$  has been moved to its extreme position cutting off all current. The segment  $E^2$  is shown as drawn out of the groove  $E^3$  before the lever  $S^1$  has reached its extreme position, where it admits full current to the fields.

This permits, by properly arranging

current to the motor fields, and, when this is fully admitted, further motion will introduce the current to the generator armature through the rheostat, the current to the fields being maintained through properly arranged contact strips, as indicated in Fig. 1.

The operation of the arrangement is as follows: The armatures of the two generators  $A$  and  $B$  are driven continuously from any convenient source of power, the generator  $A$  producing a current of the potential due to its winding and speed. The switch  $S$  being open the armature of the generator  $B$  runs idly, producing no current, and the motors  $M^1$ ,  $M^2$ ,  $M^3$ , &c., are idle, there being no current in their fields or armatures. The rheostat  $R$  being open, the closing of the switch  $S$  or moving of the lever  $S^1$  of the rheostat, depending upon which system is used, admits current from the generator  $A$  to the field coils of all the motors, bringing them up to their full magnetic strength and admitting cur-

## Press Working of Sheet Metals.—VI.

BY OBERLIN SMITH.

### Curling Process.

Somewhat analogous to forming processes, but involving a new principle not yet herein touched upon, is the operation of "curling" or "wiring," with its various modifications. The two words just quoted as names for this process

sometimes brass and copper, all of which are usually less than  $\frac{1}{8}$  inch thick. In such tools the lower die L serves mostly as a receptacle for the work, while the upper die U does the actual curling. Were the dies in question for curling only the loose ring *a* (which is driven to the upward position shown by suitable springs and limited therein by proper stops) might be omitted, the top of the die being solid. As it is, this ring is used to support a wire ring, Fig. 64, which is laid loosely around the top of the uncured work, Fig. 65, and which creeps down as ring *a* descends by the action of U. At *b* is

die L is supplied with a floating ring, as at *a*, Fig. 63. In tapered work like this it is evident that the curling, as it successively passes through the different stages shown in Figs. 70 to 73 inclusive, must grow smaller in its general diameter, as it creeps down the cone to smaller and smaller diameters of the tapered work. It is therefore necessary that the curling ring *d* should be detached from the remainder of the upper die, that it may gradually decrease its diameter as it goes downward in doing its work. That it may thus become a contracting ring, it is made in a number of sections, usually

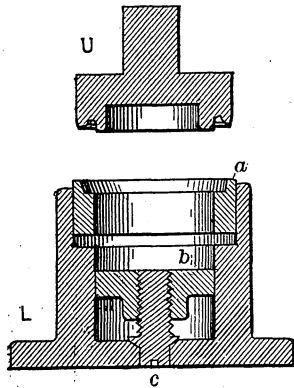


Fig. 63.



Fig. 64.



Fig. 65.

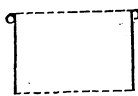


Fig. 66.

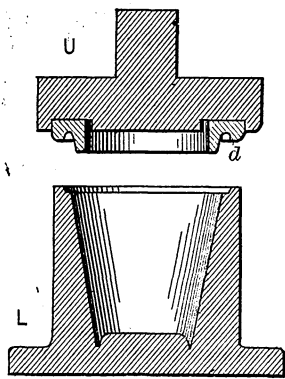


Fig. 67.

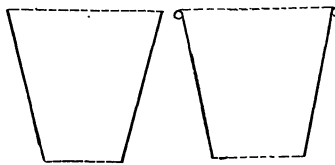


Fig. 68.

Fig. 69.

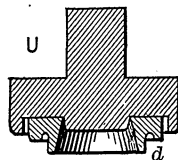


Fig. 74.

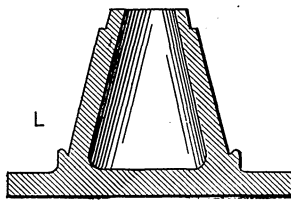


Fig. 75.

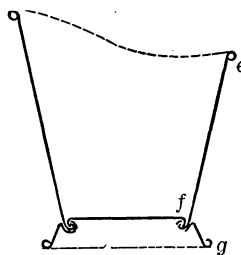


Fig. 76.



Fig. 77.

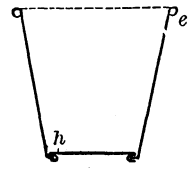


Fig. 78.



Fig. 79.

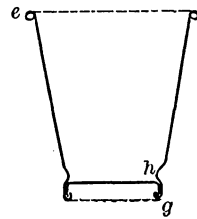


Fig. 80.



Fig. 81.

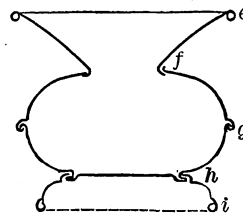


Fig. 82.

### PRESS WORKING OF SHEET METALS.

are used synonymously, although it would be correct to confine the term "curling" to the operation of putting a curled edge upon the top of a pan, cup or other vessel without any wire inside of it, this being often spoken of as imitation wiring. Real wiring is the same process when done around a ring of wire, which, of course, stiffens the vessel very much more than does the bastard process before mentioned. The latter, however, is cheaper and easier to perform, and often answers a sufficiently good purpose. In Fig. 63 is shown, in vertical axial section, a pair of outside wiring dies for cylindrical work, such as tin cups, dinner pails, &c. This process, it should be mentioned, is usually confined to thin metals like tin plate, sheet iron and

shown an adjustable bottom upon which the work rests and which is regulated by the screw *c* or its equivalent. This construction enables the same die to be used for various heights of work. In cases where but one height is required this bottom is made in a solid piece with the rest of the die, as in Fig. 67. In Fig. 66 is shown the finished work as curled without containing the wire ring, such dies being available for making it either with or without the same.

In Fig. 67 is shown a pair of curling dies for outside curling upon the large end of conical or tapered work, such as is shown uncured in Fig. 68 and curled in Fig. 69. It is suitable for dish pans, milk pans, sauce pans, buckets and such like work. Should it be desired to put in a real wire, the top of

being sawed apart radially into perhaps six or eight pieces. These are, of course, properly supported in the main body of U, and are supplied with springs to drive them outward as they ascend, so that they will be ready for the next piece of work. It is found in practice that such rings are sufficiently elastic to approximate nearly enough to a true circle as they are forced into the lower die, and that the slits, if narrow enough, do not injuriously mark the work. The work shown in Fig. 69 fairly represents the body of an ordinary sheet iron bucket. These bodies are usually made up of one or two or more sections, seamed together in lines forming elements of the cone.

In Fig. 74 is shown a pair of dies which are the exact reverse of those



just described. They are for curling the small end of conical work. In general, it is found better to confine the work outside for outside curling, and it is therefore placed within the lower die, as a receptacle, in the two former cases above mentioned. In this case, however, it is evident that the work could not be gotten into and out of such a die unless it opened in halves, but experience has proved that work of the kind here shown (which, by the way, fairly represents coffee pot bodies and such like articles) can be successfully curled after being slipped over the hornlike lower die pictured in Fig. 74, which seems to brace the body against buckling better than with straight work, &c. This and other dies of the same bulky character are made hollow merely to save metal, but could, of course, just as well be solid. The curling ring *d* has in this case an expanding rather than a contracting ac-

tion, and of a clamping device to hold the bottom and base ring in place.

In Figs. 77 and 78 are shown two similar stages of the operation of curling the top of a bucket and putting a bottom thereon, the latter, however, not being a curling operation, but rather a peculiar style of forming, where an upwardly projecting bead in bottom, *h*, is forced to bulge and bend over outwardly by the pressure brought upon it at the same time that the top curling is being done.

In Figs. 79 and 80 are shown similar stages of the operation of putting the bottom in a pail by a different method, consisting of double curling them together at *g*, while the top curl is being made at *e*. In this case a depression, *h*, has been made in the body in some kind of a roller forming machine.

In Figs. 81 and 82 are shown similar successive stages in the operations of

wire rectangular utensils or other articles having a prismatic or pyramidal rather than a cylindrical or conical form. It is true that a curling action might take place at the angles of such pyramids or prisms if they were somewhat rounded off to a curved contour, but at the sides, where the edge followed straight lines, it would simply be bent, as at the top of *M*, Fig. 86, instead of being truly curled.

In Fig. 86 is shown the bending action before referred to where the edge of the work lies in a straight line. Or, for the sake of illustration, let us suppose that *M* is a little bar of metal, standing on end, and say  $\frac{1}{4}$  inch thick by  $\frac{1}{2}$  inch wide, shown in edge view. It is evident that when this straight vertical bar is struck by the inclined surface of *U* at the point *a* and below it will be bent outward, but with a long bend, as shown, instead of a short one, as in Fig. 70. This is by reason of the

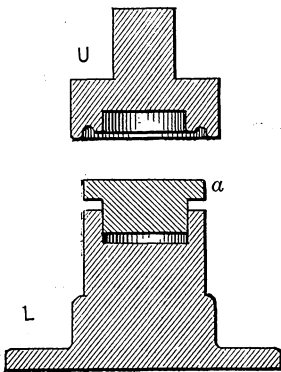


Fig. 83.

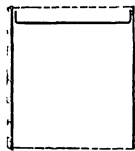


Fig. 84.

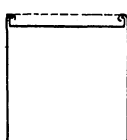


Fig. 85.

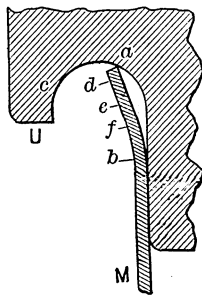


Fig. 86.

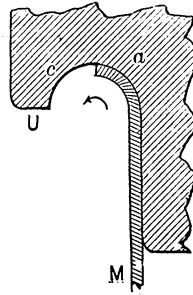


Fig. 70.

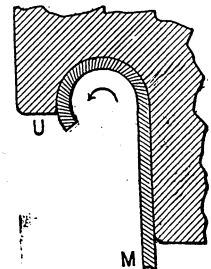


Fig. 72.

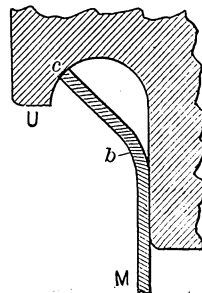


Fig. 87.

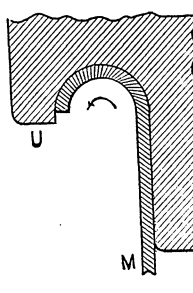


Fig. 71.

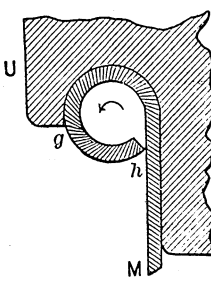


Fig. 73.

#### PRESS WORKING OF SHEET METALS.

tion, and is forced inward by springs, instead of outward, as in Fig. 67. It of course expands automatically as it is driven down upon the work.

In Figs. 75 to 82 are shown specimens of what may be called the curiosities of curling. They are combination processes, where two or more pieces, previously made of the proper shape, are assembled and fastened together, as well as given a suitable finish by various operations of curling, &c.

In Fig. 75 are shown the uncurled body, bottom and base ring of a patent coal scuttle, one side only being given and that in "slice section." In Fig. 76 the same are shown in complete section after being curled at one operation, the dies at the same stroke curling the top rim *e*, the triple joint *f* and the bottom rim *g*. Dies for such work are of course very difficult to make, especially as the top of the vessel does not lie in a normal plane, nor in a plane at all, being of the double spiral shape shown. It is, moreover, necessary to use self acting outside clamps to clamp the body securely to the horn, and also to embody vertical motions of the horn

putting together a sheet metal cuspidor. The curling at *e*, however, has in this case been done in a lathe, because the taper of the cone was too great for curling dies to work properly. The operations at *f* and *h* consist of a sort of a combined curling and smashing, somewhat similar to that shown in Fig. 78. At *g* and *i* the action is true curling, done in an inward direction.

In Fig. 83 is shown a pair of dies for putting together a body and a bottom, as shown in its successive stages in Figs. 84 and 85 respectively. The function of the spring driven plate *a* in the lower die is to support the bottom when first laid upon it, but it of course descends therewith as the curling proceeds.

#### Principles of Curling.

In analyzing the principle of the curling process we will find that it cannot be practiced upon the edge of a flat sheet of metal, and that said metal must not lie in a plane but in the surface of a cylinder, or approximately so. It is therefore not practicable to curl or

ordinary principles of leverage, which cause a bar to bend as far as possible from the end where the force is applied so as to obtain more leverage for such bending, its starting point being determined in this case by the outside resistance at *b*, which is supposed to be the confining part of the lower die. If the operation is carried a little further the top end of the bar reaches a point in the die at *c*, Fig. 87, and there is a general smash, or perhaps it is carried down in some irregular and undesired form. If, however, when it first starts to bend outward it could be confined at the point *d* on its surface and after the extreme end is bent into a short curve it could be again confined at *e*, and still later at *f*, it is evident that it would assume the proper shape and approximately follow the semicircular curvature of the die at *a*, *c*. To illustrate more plainly: supposing that we have a vessel composed of a number of the small bars *M*, arranged in a circle like the staves of a barrel, and supposing that we have a hoop at *d* which will confine them all until a bend is started



at each of their ends, and that then it will expand and another hoop at *c* will hold them until they are again bent, when this hoop in its turn expands—and so on. Such an arrangement would evidently develop a curling operation, and the action described is what really takes place, the metal itself being at the same time its own staves and its own hoops. To prove that a square can could not be properly curled along its flat sides, it is only necessary to imagine a square barrel in which, obviously, the hoops would have but an infinitely small resistance to the expansion of the staves, except at the corners.

In practical work it is found that with ordinary tin plate and sheet iron a curl of from  $\frac{3}{8}$  to  $\frac{3}{4}$  inch can be obtained, according to various conditions above indicated. For larger curls to be successfully made, much thicker metal might be required.

#### Dupont Powder Company's Proving Ground.

The private proving ground for the well-known powder manufacturing firm, E. I. Dupont de Nemours & Co. of Wilmington, Del., has been finished, and the initial tests were carried out last week with complete success. The ground, which covers 15 acres, is on the French Creek branch of the Wilmington & Northern Railroad, 18 miles south of Reading, Pa. An 8 inch rifle of the latest pattern, of Bethlehem steel, is mounted for use in the powder tests. At a distance of 267 feet from its muzzle is the target, consisting of two wing shaped walls, each 25 to 30 feet in length and 10 to 12 feet high. In front an opening is left, about 3 feet wide, at which opening the gun is aimed. The space inclosed by the walls is filled with sand.

The following particulars are given by the *Philadelphia Ledger*: At a distance of 100 feet from the muzzle of the gun is placed a bracket covered by a wire screen and 75 feet beyond this another of the same kind, through both of which the projectile passes on its way to the target. It is the degree of speed attained by the projectile while making this distance that determines the strength of the powder used. To accurately measure this speed, very finely adjusted electrical machines are used.

There are several small buildings on the grounds, the principal one being the battery house and office combined. This is located at right angles from the gun, at a distance of 300 feet. It contains all instruments used in making the tests, the battery and a set of office furniture. Adjoining this is a small building for storing acids, &c. The other buildings are a powder magazine, projectile house, tool house and gun house. The work for the present is completed, but it is the intention of the firm to greatly improve this ground later by the addition of a 10 and a 12 inch gun.

**McKeesport's Centenary.**—McKeesport, Pa., celebrated with great ceremony on Thursday, September 13, the one hundredth anniversary of its founding. Where, a century ago, a single cabin, raised by David McKee, a sturdy Scottish settler, stood at the confluence of the Monongahela and Youghiogheny rivers, a flourishing city of over 30,000 inhabitants now exists. McKeesport to day has 125 industrial estab-

lishments, employing 10,500 workers. Among the more notable of the industries of this metropolis of the Monongahela Valley are the W. Dewees Wood Company's iron works, the National Tube Works, National Rolling Mills, the National steel plant, the Monongahela furnaces, the Boston Iron & Steel Works, the United States Iron & Tin Plate Works and the works of the United States Glass Company. It possesses three great railroad systems, Baltimore & Ohio, the Pennsylvania and the Pittsburgh & Erie, besides five lines of electric roads. The railroad freights of the city amount to 1,800,000 tons a year, and those of the river to another 200 000 tons. The celebration of the city's centennial was attended by a large contingent of visitors from Pittsburgh and other places. Among the more distinguished guests were Governor Pattison of Pennsylvania, Governor McKinley of Ohio, General D. H. Hastings, General Russell Alger and a number of representatives of the Grand Army of the Republic, at that time in encampment at Pittsburgh. The two Governors were received by Mayor Andre of McKeesport and a delegation of citizens, and were led under and through a battle-mented gateway on the city line, built entirely of tin plate made at the works of the United States Iron & Tin Plate Company. Addresses were made by the two Governors, complimenting the city on its progress and the activity of its people. A parade and a ball were included in the subsequent festivities.

#### Mail Steamers for War Purposes.

Prof. J. H. Biles, the eminent naval designer, in a paper read before the Institution of Naval Architects considered at length the subject of the design of mail steamers with reference to their use for war purposes. In a vessel 500 feet by 57 feet by 40 feet there would be a permanent addition of about 605 tons, which would be a loss of weight carrying to this amount. In some ships this would mean loss of freight earning; but in others, whose earnings depend upon measurement goods, it would only involve a small extra expenditure of fuel to drive the heavier vessel. The net additional weight to be carried to equip the vessel for war would be about 2590 tons. Such a vessel on 27 feet draught would have about 5800 tons of total weight carrying in ordinary work, without allowing for the permanent additions described above. After allowing for these and the temporary additions, which make in all 3195 tons, there would be available for coal 2700 tons. This amount of coal would enable the vessel to steam at full speed for 10 days at full power, or for 20 days at half power, which is about the proportion the Admiralty regulations of two thirds natural draught power would amount to. The corresponding speeds would be about 19 and 15 knots, and the distances steamed would be 4500 and 7200 knots. Longer distances could be steamed at lower speeds. The extra cost of the structure would not be considerable, in relation to the total cost, and the modification necessary would detract but little from the commercial efficiency of the vessel, beyond the loss of freight earning due to the loss of weight carrying. It is believed that such a vessel, when fitted with her removable war equipment, would, for gun, torpedo, and protective capabilities, be little, if any, inferior to our first-class cruisers, while in speed and

coal endurance it is believed that such a ship would be superior.

It may be objected that the large size of these vessels makes them unhandy for maneuvering, but this is largely a matter of rudder area; and when we know that vessels larger than the size chosen can turn a complete circle in five minutes, much of the force of this objection is removed. The loss of money earning in such a vessel due to the permanent additions to structure would vary in different trades. Where the trade is with cargoes so light that there is no chance of the vessel being made too deep in the water by these additions, it is probable that the extra working expenses would be about £2000 per year. The first cost of these permanent additions would be about £25,000, representing about £4000 per year for interest, insurance and depreciation. In the trades where dead weight is of importance the loss of 600 tons of cargo is a more serious matter. It is difficult for a shipowner to say what loss in money is likely to be involved by such a permanent load, but it is probable that £15,000 per year would be accepted as a solatium for this loss, and this, with the £4000 due to extra first cost, would make a total contribution to the shipowner of £19,000 per year in excess of the subsidy which would be paid for an ordinary mail steamer. The cost of the armor and other protection would be about £160,000, and the guns and mountings £60,000. The interest on this sum at 5 per cent. is £11,000 per annum. This sum, added to the £19,000 above, makes a total of £30,000 per year; for which sum, in addition to the present subsidy, the country would have an efficient warship of great power, instead of a mere auxiliary to a fleet.

#### Vessels on the Great Lakes.

The books of the United States Treasury Department contain the names of 3761 vessels of 1,261,067.22 gross tons register in the Lake trade. The lakes have more steam vessels of 1000 to 2500 tons than the combined ownership of this class of vessels in all other sections of the country. The number of steam vessels of 1000 to 2500 tons on the lakes on June 30, 1893, was 318 and their aggregate gross tonnage 525,778.57. In all other parts of the country the number of this class of vessels was, on the same date, 211, and their gross tonnage 314,016.65. The classification of the entire lake fleet on June 30, 1893, was as follows:

Class.	Number.	Gross Tonnage.
Steam vessels.....	1,731	828,702.29
Sailing vessels.....	1,205	317,789.87
Canal boats.....	743	76,843.57
Barges.....	82	37,731.99
Totals.....	3,761	1,261,067.22

The gross registered tonnage of vessels built on the lakes during the past five years, according to the reports of the United States Commissioner of Navigation, is as follows:

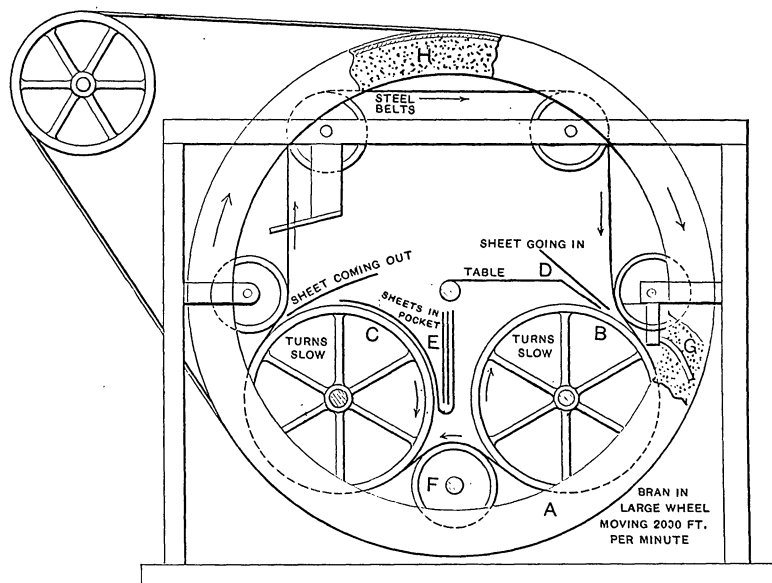
	Number.	Net Tonnage.
1889.....	225	107,080.30
1890.....	218	108,515.00
1891.....	204	111,856.45
1892.....	169	45,168.98
1893.....	175	99,271.24
Totals.....	991	471,891.97

An important discovery of a large and rich deposit of platinum ore is reported in the Sudbury mining district of Canada. The ore was found in the township of Snider, near the Tam O'Shanter nickel mine.

## Record Tin Plate Cleaning Machine

A patent recently granted to Geo. J. Record, Conneaut, Ohio, describes a tin plate cleaning and polishing machine now in successful use by the Record Mfg. Company of that place. The essential features of the apparatus are shown in the accompanying engraving, which is a sketch of a side view of the machine with parts broken away, revealing the interior construction and the general method of its operation. The primary idea of the machine is to drive a large drum at high speed, in the periphery of which is a quantity of bran for cleaning purposes. Within this outer drum are other smaller ones carrying a number of steel tapes so as to form a bed to support the tin plates. The outer drum and the inner smaller ones revolve at different speeds, the re-

over and again inserted at D, the other side being cleaned in the same manner. The manufacturers think that the machine is capable of cleaning 75 boxes of 14 x 20 plates per day by one operator. After passing through this machine the plates are put into a dusting machine, which finishes them with a very bright surface. The cleaner, a view of which is shown in the engraving, is adapted to plates of all sizes. Another feature of this machine which has an important bearing on its practical operation is the attachment G, which is a bent piece of metal that acts as a plow and continually stirs up the bran, so that it is kept in proper condition for absorbing the grease from the plates until it is all thoroughly saturated. When that happens the drum is cleaned out and fresh bran inserted. The machine has been designed with great ingenuity, the above description only telling of its



RECORD TIN PLATE CLEANING MACHINE.

sult being that when the tin plate is carried around the circumference of the smaller drum its surface is thoroughly cleaned by the bran in the periphery of the outer drum. Referring to the illustration the operation of the machine will be clearly understood. Drum A is driven in the direction of the arrows at a speed of 2000 feet per minute and contains the bran, as indicated at H. This drum is driven at a high speed so that the centrifugal force keeps the bran at the outside circumference and evenly distributed. Suitable mechanism is provided for rotating the drums B and C in the direction of the arrows, which, it will be noticed, is in the same direction as the drum itself; the speed, however, of the smaller drums is comparatively slow. Between the two smaller drums is a third one, F, while at the top are two others, around which the steel belts pass. These belts are placed about 1½ inches apart and pass over the drums diagonally, so that the portion of the plate covered by them continually changes and the whole surface is thus brought into contact with the bran. The plate is introduced at D, passes around the drum B, over the smaller drum F, then around the drum C, and is finally delivered into the pocket E, the operation, it will be understood, thoroughly cleaning one side of it. From this pocket it is taken by hand, turned

general operation and important features.

Havana journals comment in a most unfavorable strain on the recent action of the Spanish Minister of the Colonies in regard to the abrogation of the reciprocity treaty between the United States and Cuba and the imposition of heavy Cuban duties on the products of this country. The *Weekly Report* of Havana states that the inhabitants of the island clearly foresee the results that will befall them, and a sentiment of great dissatisfaction prevails among them. The new duties, too, bear particularly hard just at this time when business is so depressed throughout the island of Cuba. Enormous duties, says the *Report*, are being applied since the 28th ult., and prices for all American goods, provisions especially, have advanced in an extraordinary manner; for instance, flour, whose duty was only \$1.10, pays to day \$5.22½ per 100 kg.; lard, bacon and hams, which were on the list of free articles, are respectively subject to-day to duties of \$11 and \$8.50 per 100 kg.

The Chicago City Railway Company have completed the purchase of their electrical equipment by closing a contract with the McGuire Mfg. Company of that city for 120 trucks. They are

to be of the Columbian type; a truck that has made a reputation throughout America and in many parts of Europe. The same trucks were in use on electric lines of this company in operation during the World's Fair and successfully withstood the most severe service that an electric railway was ever called upon to perform. They have practically demonstrated that a 9-foot wheel base truck can be successfully run on a track where the curves are not greater than 40 feet radius. They therefore specify that their new truck shall have a 9-foot wheel base; frames to be made of steel, either forged or pressed, at the option of the manufacturing company; the Griffin cast wheel and Westinghouse motor suspension.

## The Minnesota Canal.

The Minnesota Canal Company, whose project is of such magnitude as to excite the gravest doubt as to its practicability, but whose good faith and belief are shown by two years' engineering work at heavy expense, and by constant purchases of land for the right of way, made public recently for the first time many of their plans. So quietly has the work of the company been carried on that few persons, even those to be most benefited, have realized the enormous meaning of the scheme—if ever carried to fruition. In brief, the purpose of the company is to construct an extensive system of navigable canals and waterways with a view of utilizing the enormous power of the streams that flow into the head of Lake Superior. These streams have a fall of 600 feet or more in a few miles, and two canals are planned, one to tap the waters of the St. Louis River, discharging it at the elevation of 610 feet on top of the hill above the city, the other tapping streams to the easterly and discharging them also above the city. By the canal as at first designed 140,000 horse power is claimed to be available, but it is designed to enlarge the prism of the canal to such an area as will give 300,000 horse-power. This all, the engineers compute, will be utilized by the year 1905, and it is believed by them to be possible to so increase storage reservoirs as to ultimately supply, through a canal 300 feet wide on the bottom and 80 feet deep, 1,150,000 horse-power. Lands have been bought for a very considerable part of the right of way of one of these canals, elaborate estimates have been made and it is stated that construction is to begin the coming winter.

## Steam Power of the World.

The following figures are given by the Bureau of Statistics in Berlin: Of the steam engines now working in the world four-fifths have been constructed during the last 25 years. France has 49 590 stationary and locomotive boilers, 1850 boat boilers and 7000 locomotives; Germany 59,000 land boilers, 1700 ship boilers and 10,000 locomotives; Austria, 12,000 boilers and 2800 locomotives. The working steam engines of the United States represent 7,000,500,000 horse-power; Germany, 4,500,000 horse-power; France, 3,000,000; Austria, 1,500,000. This estimate does not include the locomotives, whose number in the world is 105,000, representing a total of 3,000,000 horse-power. The world's steam engines, aggregate more than 26,000,000 horse-power, equivalent approximately to the work of 1,000,000,000 men.

### New French Locomotives.

European journals give some particulars in regard to 40 powerful locomotives of a new type which have just been turned out at the works of the Paris, Lyons & Mediterranean Railway Company. Their principal peculiarity consists in the fact that they are so formed in front as to resist the pressure of the air. They are compound engines with four cylinders. All the parts, cylindrical or vertical, including the funnel, the dome, the fire box and the "cab" or shelter, are furnished with inclined planes of metal designed to cut through the air very much as the bow of a boat cuts through the water.

By this mean not only can trains be run faster if required for express passenger service, but the speed of the other trains can be maintained, while a considerable saving of coal can be effected. Such are said to be the results obtained at some trials of the new engines, which it may be mentioned, are rather unsightly as compared with the ordinary types. The saving of coal, speed for speed, is said to be as much as 10 per cent.

### Treasury Decisions.

#### *Circular Steel Plates for Electrical Machine*

Before the U. S. General Appraisers at New York, August 11, 1894. In the matter of the protest, 22,9585-9481, of John W. Hampton, Jr., & Co. against the decision of the Collector of Customs at Philadelphia, Pa., as to the rate and amount of duties chargeable on certain circular steel plates, imported per "British Friace," March 22, 1894. Opinion by Wilkinson, General Appraiser.

The goods are circular steel plates, about 30 inches in diameter, with slotted peripheries and key wayed centers. They are assessed for duty at 45 per cent., and are claimed to be dutiable as washers under the provision of paragraph 176, N. T., for spikes, nuts and washers.

We find that the articles are finished parts of an electrical machine, and that they have been advanced beyond the condition of goods commonly known as washers.

The protest is overruled accordingly.

#### *Emery Wheels and Emery Paper*

Before the U. S. General Appraisers at New York, August 11, 1894. In the matter of the protests, 66,832a-4447 and 67,285a-5214, of Sussfeld, Lorsch & Co. against the decision of the Collector of Customs at New York as to the rate and amount of duties chargeable on certain emery wheels and emery paper imported per "Dania," March 6, 1894, and "La Champagne," March 13, 1894. Opinion by Wilkinson, General Appraiser.

The goods are emery wheels and emery paper. They were assessed with duty at 20 per cent. and 25 per cent., respectively, and are claimed to be dutiable at 1 cent per pound under paragraph 437 and section 5, N. T.

We find as to the wheels: 1, They are unenumerated manufactured articles, and, 2, they are composed of emery and cement, emery chief value.

Section 5 provides that "on articles not enumerated, manufactured of two or more materials, the duty shall be assessed at the highest rate at which the same would be chargeable if composed wholly of the component material thereof of chief value."

We are of the opinion that the emery wheels fall within the provision quoted, and we sustain the claim that they are

dutiable at 1 cent per pound under paragraph 437.

We find that the emery paper is paper, and that it is commercially known as paper. The assessment of duty thereon at 25 per cent. under paragraph 432 is affirmed.

### British Railroad Statistics.

A British Board of Trade return recently issued gives some interesting particulars regarding the railroads in the United Kingdom. Their paid up capital is equal to \$205,825 per mile of line open. The number of passengers conveyed last year, exclusive of season ticket holders, was 873,177,052, and the income derived from passenger traffic was \$172,077,360, or a proportion to total receipts of 44.46. The gross receipts from goods traffic amounted to \$196,774,258, and the proportion to total receipts was 50.84. Traffic yielded, therefore, \$368,851,618, or \$17,865.50 per mile of line open. Rents, tolls, navigation and steamboats earned receipts amounting to \$16,165,469, making the grand total of receipts, from all sources, \$385,017,087. The working expenditure was \$219,496,571, or a proportion to total receipts of 57. The total net receipts were \$165,520,516, or a proportion to paid up capital of 3.60.

A fact which reflects the character and extent of railway economies during the past year is found, observes the *Journal of Commerce*, in the report of the Westinghouse Air Brake Company for the fiscal year ending March 31, 1894. The net earnings for five fiscal years, ending March 31, were: 1894, \$518,695; 1893, \$2,100,000; 1892, \$2,400,000; 1891, \$1,695,795; 1890, \$1,350,798. It will be observed that the net earnings of the company for 1893-94 are less than one-quarter of those in the year 1892-93, and about one-fifth of the net returns of 1891-92. The president of the company states that there has been practically no increase in the number of engine and car equipments during the year, the business of the company having consisted chiefly of the sale of supplies for repairs and maintenance.

The Educational Department of the Young Men's Institute, 222 Bowery, New York, will be formally opened October 2. Instruction will be given in the following mechanical subjects: Steam engineering, practical electricity, sanitary plumbing, carriage drafting and mechanical, architectural and free hand drawing. Instruction will also be given in the following commercial subjects: Arithmetic, bookkeeping, penmanship, shorthand, typewriting, English grammar and composition. A distinctive feature of this educational work is that the theory is taught to those who are getting the practical part of the subject in their daily work. The school year continues until May, and instruction is open to any young man over 17 upon payment of a small fee.

Without making invidious comparisons, the fact can be noted that the Illinois Steel Company of Chicago have built up an enviable reputation for prompt fulfillment of contracts. This has inured very greatly to their benefit during the past year. Business has been secured in which price was not altogether the leading consideration, but reputation for promptness in delivery

was an important factor in influencing the mind of the purchaser. It is a cardinal principle with General Sales Agent Julian L. Yale to make no promise which he is not absolutely certain that he can keep. The promise once given, nothing is permitted to interfere which can be avoided by human foresight.

### Weight and Horse-Power of Rain.

The following interesting calculations were presented before the Engineers' Club of Philadelphia:

One inch of rain falling upon an area of 1 square mile is equivalent to 2,323,200 cubic feet, or nearly 17,500,000 gallons, and this quantity of water will weigh 145,200,000 pounds, or 72,600 short tons. If 1 inch of rain fell over the entire area of the city of Philadelphia, 129 square miles, the quantity of water which would be precipitated would be represented by 1,250,000,000 gallons, or 18,730,000,000 pounds, or 9,365,000 short tons. Therefore the quantity of water represented by 1 inch of rainfall distributed over 24 hours falling upon the area of Philadelphia would be nearly ten times the maximum pumping capacity of all our water works engines for a day, and is more than twice the total capacity of all the reservoirs now connected with the city water supply. Professor Loomis gives the height of clouds as about 2 miles, and as the aqueous vapor always present in the atmosphere is suspended for a considerable time and carried for great distances by winds, it is highly probable that the great majority of the water which falls as rain has been elevated by the sun to a height approximating 10,000 feet.

While it would be fair to assume this figure in calculations, there may be objection to it on the ground that the clouds from which much of our rain is precipitated are not more than  $\frac{1}{4}$  mile above the earth, and, therefore, a height of but 3000 feet will be estimated for, but those who desire to assume the greater elevation can readily calculate what the figures would be for 10,000 feet. As shown above, the weight of 1 inch of rain upon 1 square mile is 145,200,000 pounds, multiplying this by 3000 feet for the height, and dividing by 60 on the assumption that this inch of rain fell in one hour, we have as a result 7,260,000,000 foot-pounds, representing the amount of work done by the sun per minute if the water was raised as rapidly as it fell. This is equivalent to 220,000 horse-power. If pumping machinery worked at the low economy of 2 pounds of coal per horse-power per hour, or if the pumps gave a duty of 100,000,000 foot-pounds, 200 gross tons of coal would be required to raise to a height of 3000 feet the water represented by 1 inch of rain on a square mile; now, multiplying this by 129 to represent the area of Philadelphia, we have 28,380,000 horse power and a coal consumption of 25,800 long tons.

Momeyer & Story Company of 99 John street, New York, closed a contract on September 8 with Brooklyn, by which they are to supply the city with a temporary water supply of 5,000,000 gallons daily. They are equipping the plant with large improved artesian wells, complex pumping engines, boilers, &c., at Spring Creek Station. To complete the plant the total cost of same will probably run in the neighborhood of \$80,000.

The plant is to be completed inside of three weeks, which will be the quickest time on record that a plant of this character has ever been undertaken.

### Trade Publications.

"GRAND RAPIDS, MICH., AS IT IS, 1894," is the subject of an attractive pamphlet issued by the Board of Trade of that city. From a trading post in 1833 to a city of 80,000 inhabitants in 1894, the history of Grand Rapids is one of steady progress and development. The pamphlet is profusely illustrated with views of street scenes, public institutions, private buildings and industrial establishments. Grand Rapids' advantages as a manufacturing center, and its attractions as a place of residence, are graphically set forth.

"NOT A FAIRY TALE, BUT THE HONEST TRUTH" is the title of a little pamphlet by the Meriden Machine Tool Company of Meriden, Conn. On the first page is the picture of a mule and a locomotive with the statement that "there is almost as much difference between a hand lathe and our farming lathe, as far as the amount of work that each will do is concerned, as there is between this (the mule) and this (the locomotive)." Then follows a description of this lathe and statements of the work it will do.

WE HAVE RECEIVED from the Hartford Machine Screw Company of Hartford, Conn., a catalogue of their strictly automatic machinery for turning out and finishing metal work. In the introduction it is stated that this company were the pioneers in the manufacture of this automatic machinery, and that therefore they are the possessors of the underlying patents on the same. Although these machines have never before been illustrated, nearly 3000 automatic screw machines have been disposed of on their merits. They are simple in construction, readily understood and capable of being changed from one class of work to another as easily as hand machines, from the fact that the makers early adopted the approved monitor construction, merely making them automatic, which enables one operator to attend a large number. These machines are not only suitable for special purposes, but are such as may readily be changed from one class of work to another as the conditions require, this being an advantage over many of the automatic machines brought out of late, which are only adapted to special work. These machines are now running successfully on bicycle work, electrical appliances, clocks, guns, mill supplies, engines and, in short, every class of material that requires to be turned, drilled or threaded.

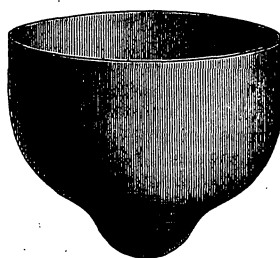
**The Banner Lake Cargo.**—The banner cargo of the Great Lakes was carried to the Illinois Steel Company's docks at South Chicago by the steel steamship "S. S. Curry," which arrived there on the evening of the 9th inst., with 5117 net tons of iron ore from Escanaba, in addition to fuel. The "Curry" drew 18 feet 2 inches, which is stated to be the deepest draft thus far loaded to by a lake vessel. Notwithstanding this great draft the vessel was easily landed alongside the steel company's dock. On the next day the cargo was unloaded in 10 hours 35 minutes, an unprecedentedly short time. The largest previous cargo for lake vessels was that taken by the "Maritana," from Escanaba to South Chicago. It amounted to 4774 tons on a draft of 17 feet 6 inches.

Rapid progress is being made with the building of the Morton Tin Plate Company's plant, at Cambridge, Ohio. Ground was broken August 20, and the foundations are completed for three hot mills, three cold rolling mills, and all foundations are built for boilers, pick-

lers, shears and other machinery. A bed of fine sandstone, 12 feet in thickness, was found on the property shortly after its purchase by the new company, and has been largely used in the foundations. It is expected that the rolling mills will be in operation by December 15. Steps will then be taken toward the erection of the tinning departments.

### Steel Cylinder Head.

The Cleveland Stamping & Tool Company of Cleveland, Ohio, have just completed a large contract for steel cylinder heads of the peculiar shape shown by the engraving. These heads



Steel Cylinder Head.

are drawn from No. 14 gauge metal and are 17 inches in diameter by 14 inches deep.

The Louisville & Nashville Railroad Company have issued supplement No. 1 to their pig iron tariff of July 1. Following are the more important points affected:

To	From South Pittsburg, Tenn.	Chattanooga, Tenn.	Birmingham, Ala., and group.	Sheffield, Ala., and group.
Ashtabula, Ohio.....	2.98	3.05	3.55	3.30
Detroit, Mich. ....	2.93	3.00	3.50	3.25
Duluth, Minn. ....	4.77	4.85	5.10	4.85
Indianapolis, Ind. ....	2.50	2.60	2.85	2.60
Joliet, Ill. ....	2.90	3.00	3.25	3.00
Milwaukee (rail and water).....	2.95	3.05	3.30	3.05
Newcastle, Pa. ....	2.98	3.05	3.55	3.30
Salt Lake City, Utah. ....	16.85	16.96	16.96	16.51
Superior, Wis. ....	4.77	4.85	5.10	4.85
Toledo, Ohio.....	2.68	2.75	3.25	3.00
Youngstown, Ohio..	2.98	3.05	3.55	3.30

The advances are effective September 24, and the reductions September 17.

Tests have been made in Cologne recently of the Thomson method of electric welding and the Lagrange & Hoho method, known familiarly as the water bucket forge. The most striking point developed by the tests was the great difference in the consumption of power in the two methods. The Thomson system called for 3.17, 3.12, 3.62, 3.66, 4.84 and 2.81 horsepower per square centimeter of section, while the Lagrange & Hoho consumed 15.4, 11.5 and 9.3 horsepower in the different samples tested.

The William Cramp & Sons Ship & Engine Building Company have just paid a 2 per cent. quarterly and a 10 per cent. extra dividend.

## THE WEEK.

United States Consul-General Penfield, at Cairo, has informed the State Department that the Egyptian Government has issued an invitation to architects in general to submit designs for a museum to be built at Cairo at a cost of \$615,000. The successful design will receive a prize of \$3150, and \$2100 will be divided among the next four designs. It is understood that the Khedive is particularly anxious to get designs from Americans.

The report of the Comptroller-General of Patents in Great Britain, just issued for 1893, shows great activity in invention. The total number of British patents applied for during the year was 25,120, an increase on the previous year of 951. The number of applications under the International Convention was 174. Gross receipts on account of patents and trade-marks were \$839,375, against a gross expenditure of \$440,500.

A decision of the United States Circuit Court of Appeals in Philadelphia, which was given last week in favor of the Westinghouse Electric Company, reversing the decision of Judge Green of the United States Circuit of New Jersey on the Edison-Westinghouse infringement case, is one of the most important patent rulings ever given. The General Electric Company claimed that the Edison feeder and main patent covered almost all the large electric lighting plants that have been erected by the Westinghouse Company, and that the enforcement of the patent would give them—the General Electric Company—a practical monopoly of central station lighting, whether by the direct or alternating system. This patent, by the present ruling, is declared to be void for lack of invention, leaving the Westinghouse Company a clear field.

Exports of domestic breadstuffs, provisions and mineral oils from the United States during the month of August last and during the eight months ended August 31, 1894, according to the report of the Government Bureau of Statistics, were, in value, as follows, compared with the corresponding periods in 1893:

	August, 1894.	August, 1893.
Breadstuffs.....	\$10,851,336	\$22,630,348
Provisions.....	15,920,185	13,472,859
Mineral oils.....	3,665,011	4,084,255

	—Eight months— ended August 31, 1894.	1893.
Breadstuffs.....	\$85,348,714	\$129,361,102
Provisions.....	122,737,409	103,498,009
Mineral oils.....	25,618,520	27,099,461

In his message to the Mexican Congress on its reassembling on Sunday, President Diaz states that the Mexican Government has sold since April last nearly 1,000,000 acres of land to private individuals. During the last six months, he says, 111 km. of new railroads have been built, making a total of 11,100 km., and the construction of the important Inter-oceanic Railroad to Tehuantepec has been completed. The President looks for a greatly improved financial condition in Mexico this year.

Pacific Coast journals report that G. A. Walkup of Chicago has completed arrangements for building an electric road from Merced, Cal., to Yosemite, a distance of 70 miles. Mr. Walkup is said to represent a number of Eastern capitalists who have over \$3,000,000 invested in that district. The scheme embraces the supply of power to the various manufacturing interests at



Merced, which will be generated from Merced Falls.

Efforts are being made to enlist public sympathy in support of the proposed ship canal from the Georgian Bay, an arm of Lake Huron, to Lake Ontario. Last week several gentlemen from Toronto delivered addresses at Chicago before members of the Chicago Board of Trade, the Produce Exchange and the Lumbermen's Association, setting forth the advantages accruing to lake commerce from the construction of this canal, which would shorten by 300 miles the water route between Chicago and Toronto. The proposed canal is to be constructed for vessels drawing 20 feet, and is estimated to cost \$40,000,000. It would avoid the long route through the St. Clair and Detroit rivers, Lake Erie and the Welland Canal.

The London *Statist* publishes an authoritative estimate placing the world's coffee crop of 1894 at 12,500,000 bags, the largest in the history of the trade. As the maximum consumption of coffee is 10,500,000 bags the *Statist* thinks that a crash in the coffee market is in order next spring.

Warren Webster & Co., Camden, N. J., report considerable activity at their works. Among recent orders received for Webster vacuum feed water heaters and purifiers of large size were the following: B. & O. Tunnel Plant, Baltimore, Md., 3000 horse power; Westinghouse Electric & Mfg. Co., Brinton, Pa., 2500 horse-power; Pennsylvania Bolt & Nut Company, Lebanon, Pa., two 1000 horse-power; Cincinnati Street Railway Company, 1000 horse-power; the City of Boston, a special machine; Fairfield Paper Company, Fairfield, Mass., 600 horse-power; Chicago Edison Company, North Side Station, Chicago, 2000 horse-power; the Johnson Company, Lorain, Ohio, 3000 horse-power; Philadelphia Gas Company, two 600 horse-power, and one 500 horse-power. The firm have also received a number of orders for Webster separators and for the Williams vacuum system of steam heating.

The latest reports from the Orient give news of a decisive victory on land by the Japanese forces. Japan's sea forces are also said to be preparing for an important engagement. So far, the superior organization of the Japanese has prevailed over the enormous resources of China.

The statistics of the New York Custom House, just issued, show that the amount of merchandise entered and not withdrawn from the bonded warehouses at this port, in the month of August, increased \$584,699 over the same period of 1893. The figures exhibit, however, a decrease of \$1,208,472 over July of this year. As goods were received in unusual quantity in the warehouses during August, just before the new tariff law came into force, the decrease is attributable entirely to the extraordinary rush to withdraw merchandise during the last four days of the month, the new law having become operative on August 28. Had it not been for this circumstance August's figures would have shown a large increase over those of July. At the rate at which bonded goods have been withdrawn in the first half of this month it is estimated that the decrease in the value of goods in the warehouses in September, as compared with August, will be quite \$7,000,000.

### The Scranton Suit.

Judge Green has filed an opinion in the United States Circuit Court of Appeals in favor of William Walker Scranton and Walter Scranton in an important litigation growing out of the organization of the Lackawanna Iron & Steel Company of Scranton, Pa.

A number of the stockholders of the former Scranton Steel Company charged that \$350,000 in bonds of the new company, paid to William Walker Scranton, the president of the old company, and to Walter Scranton, its vice-president, under an agreement that the two Scrantons, who are brothers, should not re-engage in the business of competition with the new company, should not have been paid to them, but to the old company itself. The Scrantons claimed that the \$350,000 in bonds were a bonus to them. The matter was originally heard by Judge Acheson in the Circuit Court, at Pittsburgh, and resulted in the bonds being awarded to the Messrs. Scranton.

The dissatisfied stockholders of the old company took an appeal from the finding, and the case was argued here last March before Judges Dallas, Butler and Green. The complaining stockholders are Louis H. Bristol, Ezekiel G. Stoddart, Henry L. Hotchkiss, Charles L. Johnson, Edward M. Reed and Robert S. Ives of New Haven, Conn.; Carlos French of Seymour, Conn.; Eugene S. Bristol of Chicago; Charles N. Yeamans of Westfield, Mass.; William B. Murdoch of Barnes, La., and Joseph P. and William A. Earle of New York.

At the argument it was urged that the old company were organized in 1881, with a capital stock of \$600,000. In 1885 the stock was increased to \$750,000. The plaintiffs contended that they invested in their holdings of stock upon the representation made by the defendants that they had a special and particular knowledge and skill in the business to be carried on, &c., so that by obtaining control of the stock competition with other corporations could be successfully carried on. The two Scrantons owned about one-half of the stock, and besides being president and vice president, respectively, were also directors. It was urged by the complainants that in 1890 the two Scrantons tried to sell out the controlling interest by selling their own stock and that of some relatives and dependents to a rival concern; that in pursuance of this the Messrs. Scranton at that time offered to sell stock of the par value of \$400,000 for \$1,000,000; that this was kept secret from the plaintiffs, but the scheme fell through; that subsequently in the same year the defendants entered into negotiations with the Lackawanna Coal & Iron Company, also of Scranton, for the purpose of consolidating the two companies. These negotiations were said also to have been kept from the complaining stockholders.

In January, 1891, a preliminary agreement was made by the two companies. Under this the old company was to transfer \$2,800,000 worth of property for which there was to be given \$3,000,000 of Lackawanna Iron & Steel Company stock and \$600,000 in bonds. Meetings were held, but, it was alleged, the stockholders of the old company were not informed that the Messrs. Scranton had made a private agreement under which they were to receive \$350,000 in bonds of the new company. Afterwards the arrangements mentioned were carried out. It was said that President Scranton held 1,845 shares of

stock in the old company and Vice-President Scranton held 920 shares, while the complaining stockholders held but 1,575 shares of the capital stock of 7,500 shares.

Judge Green, in his opinion, says: "In our opinion the transaction as consummated, so far as the consolidation of these two companies is concerned, is not tainted by a scintilla of fraud on the part of the defendants. It was conducted openly and fairly; was brought in its earlier and later stages to the knowledge of a very large number, if not of all, the stockholders interested, who were represented by the defendants; and the terms of the consolidation as finally agreed upon when submitted to the stockholders of the Scranton company, including the complainants, was approved not only with entire unanimity, but as well as a great 'triumph.' On this point of the case we accept and paraphrase the conclusion of the court below, that the contract of consolidation was conceived in integrity of purpose; was born of good faith, and was indelibly marked with the impress of honor and fair dealing."

After fully reviewing in favor of the Scrantons another point raised—that even if there was no fraud, the relations which the Scrantons held to the Scranton Steel Company should have kept them from making an agreement which would inure profitably to them personally and that such profit should have gone to the company—Judge Green said: "The principle of equity which is relied upon justifies itself on the ground that the agent's interest must in nowise or manner conflict with or antagonize or at least be diverse from the interest of his principal. His fidelity in the discharge of the duty cast upon him by the relationship assumed must not be weakened by the demands of a personal interest."

"But in the case at bar the interests of the Scranton Company were not only strongly asserted and fully protected by their chosen agents, these defendants, in the consolidation, but as well the assertion and protection were made possible, and only so, by the consent of the Scrantons to accept the bonds in question as compensation for their retirement from all rivalry with the proposed new corporation to be born of the consolidation. Had they refused to sell their time, their experience, their knowledge, their ability, the stockholders of the Scranton Company never would have had the opportunity to wire their congratulations to William W. Scranton upon the successful achievement of the consolidation and upon the great 'triumph' which he had won for them. To quote from the exhaustive opinion of Judge Acheson in the court below, 'in no proper sense were the bonds in controversy a profit made out of the agency or fiduciary relationship which here existed. They were not a gratuity, nor were they paid to the Scrantons because of their fiduciary portions. . . . The two contracts were distinct in parties, subject matter and consideration.' These conclusions, so tersely expressed, answer completely the contention of the appellants. We unhesitatingly concur in them. The result is that the judgment below is affirmed."

A British service journal states that an official estimate made by the Admiralty places the average cost of construction of a modern first-class battle ship at from \$418 to \$432 a ton in France and Germany, \$374 a ton in the United States and \$288 a ton in Great Britain.

## Washington News.

(From our Regular Correspondent.)

WASHINGTON, D. C., September 18, 1894

The improved plates for shields for gunners from better material than now in use have practically proven a failure. It is not proposed, however, to stop at these trials. It is expected that experience will evolve something better than the material now in use.

The official report on the test of chrome steel and copper  $\frac{1}{4}$  inch shield plates and chrome steel  $\frac{1}{4}$  inch shield plates, September 11, 1894, at Indian Head, has just been received. The following is an abstract of details and results. There were plates as follows: One  $\frac{1}{4}$ -inch chrome steel plate from the Brooklyn Chrome Steel Works, one  $\frac{1}{4}$ -inch chrome from the Midvale Steel Works, one  $\frac{1}{4}$ -inch chrome from the Brooklyn Chrome Steel Works, one  $\frac{1}{4}$  inch chrome steel from the Midvale Steel Works, and one  $\frac{1}{4}$  inch tempered copper plate from E. G. Salter, Detroit, Mich., made September 7, in the presence of the chief of the bureau on September 8, 1894.

For the inclined fire test with the 1-pounder, the plates were mounted on 3-pounder pivots as in service, with an inclination of  $40^\circ$  to the line of fire, otherwise they were normal to the line of fire from the 1-pounder or 6-mm. rifle.

The result of the 1-pounder tests was as follows: Shell, 1-pounder Hotchkies armor piercing steel, manufactured by the Winchester Repeating Arms Company and reduced to 1-pounder or service weight by drawing the fuses and cutting off part of the base plug. The muzzle velocity was 1750 foot seconds.

The Brooklyn Chrome Steel plate  $34 \times 48 \times \frac{1}{4}$  inch, weight 236 pounds, mounted as above, showed the following: Round 1. Charge, 141 grams; striking velocity, 1750 foot seconds. Plate penetrated and broken up; shot hole  $2\frac{1}{4} \times 1\frac{1}{4}$  inches; two through cracks 5 inches long; back bulge broken off; plate dished  $\frac{3}{8}$  inch. Round 2. Charge, 106 grams; striking velocity, 1480 foot seconds, corresponding to range 200 yards. Plate penetrated and broken up. Round 3. Charge, 82 grams; velocity, 1256 foot seconds, equal to range of 400 yards. An irregular piece of plate  $6 \times 3\frac{1}{2}$  inches was broken out; through cracks; shell broken off at the band score, but the point and ogival remained in good condition. Experiments with the 1-pounder were continued with this plate.

One-half-inch plate, Midvale Steel Works, dimensions and mount same as chrome, weight 233 pounds. Round 1. Charge, 82 grams; velocity, 1256 foot seconds, equal to 400 yards range. Plate broken up; gouge  $\frac{3}{8}$  inch deep (not through the plate) 3 inches long and  $1\frac{1}{2}$  inches wide; dished at impact  $\frac{3}{8}$  inch. Round 2. Charge, 106 grams; velocity, 1480 foot seconds, equal to 200 yards range. Penetrated the plate; shot hole  $3 \times 1\frac{1}{2}$  inches; gouge on under edge; back bulge  $1\frac{1}{2}$  inches high not broken off; dished  $\frac{3}{8}$  inch around impact; two cracks. Round 3. Plate set with surface normal to line of fire; charge, 50 grams; velocity, 932 foot seconds, equal to 1000 yards range. Penetrated as far as the shoulder of the ogival and rebounded 100 feet to front practically uninjured; back bulge  $1\frac{1}{2}$  inches high; dished  $1\frac{1}{2}$  inches; five radial star cracks  $1\frac{1}{2}$  inches long around shot hole.

Copper  $\frac{1}{4}$ -inch shield. Dimensions same as chrome plate above; weight, 224 pounds; mounted same. Round 1. Charge, 82 grams; velocity, 1256 foot seconds, equal to 400 yards range. Shell penetrated without breaking up; shot hole smooth; fringe on top  $\frac{3}{8}$  inch high; back bulge  $\frac{3}{8}$  inch high and not broken off; no cracks developed. Round 2. Charge, 56 grams; velocity, 1004 foot seconds, equal to range of 800 yards. Shell penetrated without breaking up; fringe over shot hole  $\frac{1}{4}$  inch high; back bulge  $\frac{3}{8}$  inch high, not broken off; dished  $\frac{3}{8}$  inch at impact; no cracks.

Experiments with the 1-pounder with this plate were discontinued.

One-quarter-inch plate, Midvale Steel Works. The conditions for test, size, inclination, &c., were the same as the  $\frac{1}{4}$ -inch plate. Round 1. Charge, 39 grams; velocity, 792 foot seconds, equal to range of 1500 yards. Penetrated the plate; a piece 1 inch square was broken out of the plate on the left edge of shot hole; dished; back bulge  $1\frac{1}{2}$  inches high. Round 2. Charge, 25 grams; velocity, 572 foot seconds, 2594 yards range. Shell glanced off uninjured, making a gouge  $\frac{3}{8}$  inch deep, but not through. Round 3. Charge, 32 grams; velocity, 683 foot seconds, equal to 2000 yards range. The shell penetrated the plate, remaining uninjured; three through cracks.

One-quarter-inch plate, Brooklyn Chrome Steel Works. Dimensions same; weight, 122 pounds; same mount and incline. Round 1. Charge, 32 grams; velocity, 683 foot seconds, equal to 2000 yards range. Penetrated; piece 2 inches in diameter broken out; two through cracks. Round 2. Charge, 25 grams; velocity, 572 foot seconds, equal to 2595 yards range. Failed to penetrate and rebounded; made a through crack and dished.

Experiments with the 6-mm. small arm rifle steel jacketed bullet. Weight, 135 grams; charge, 35 grams rifleite.

One-half-inch plate, Midvale Steel Works, set normally. Four rounds fired; two penetrated at 50 yards, two failing to penetrate at 100 yards.

One-quarter-inch Brooklyn Chrome steel, set as above. At 200 yards bullet splashed the plate; at 150 yards it penetrated the plate.

One-half-inch copper shield plate, set normally. The bullet penetrated the plate at 100 yards.

Summary.—The 1-pounder, service velocity (muzzle) 1750 foot seconds and service weight of shell (1 pound), will perforate  $\frac{1}{4}$ -inch plate at a range between 200 and 400 yards and the  $\frac{1}{4}$ -inch Brooklyn chrome steel plate at 400 yards as mounted. The plates showed themselves to be of inferior quality, and the experiment as to the lower half of adjacent supports was not carried out.

The 1 pounder, under conditions mentioned, will perforate Midvale  $\frac{1}{4}$  inch plate at a range between 2000 and 2600 yards and will perforate and break the  $\frac{1}{4}$ -inch Brooklyn chrome steel plate at about 2600 yards.

Under the conditions mentioned, with the exception that the shell strike normally, the 1-pounder will perforate the  $\frac{1}{4}$ -inch Midvale plate at about 1000 yards.

The  $\frac{1}{4}$ -inch Brooklyn chrome steel plate and the  $\frac{1}{4}$ -inch copper plate being of inferior quality no shots were fired striking normally.

The new 6 mm. navy rifle will perforate the  $\frac{1}{4}$  inch Midvale steel plate at ranges between 50 and 100 yards, the  $\frac{1}{4}$ -inch Brooklyn chrome steel plate at between 50 and 200 yards and the  $\frac{1}{4}$ -inch

copper plate at 100 yards or over. The muzzle velocity for the 6-mm. rifle was about 2550 foot seconds, as determined by the mean of six rounds fired with the gun used and the same lot of ammunition.

## Wages in Sheet and Tin Mills.

The result of the vote now being taken among the lodges of the Amalgamated Association in Western sheet and tin plate mills affected by the proposed reduction in wages on account of the lowering of the duty on tin plate from 2.2 cents per pound to 1.2 cents per pound, is expected to be known this week. While little official information concerning the matter has been given out by either side, it is expected that the proposition of the manufacturers to reduce wages about 25 per cent. will be rejected, and a counter proposition will be made by the men agreeing to accept a reduction averaging 10 to 15 per cent. The sheet roller suffers most under the proposed reduction, his wages being cut about 30 per cent. and other labor on down to 15 per cent., the average reduction being 25 per cent.

Tin plate makers and concerns rolling sheets for tinning purposes claim that the reduction in duty under the new tariff warrants a much larger reduction in wages than they have asked for, and regard the reduction proposed by them as being very favorable to their employees and claim that it should be accepted. On the other hand, the employees hold that they submitted to a reduction last year, and that it is asking too much of them to accept another heavy cut this year. While a satisfactory adjustment of the matter is not improbable, the outlook for this just now is not favorable. Several of the larger concerns operating sheet and tin mills have stated that they will run non-union unless their men accept the proposition made to them at the recent conference at Pittsburgh. That the Amalgamated Association will do all in its power to avoid a conflict is certain, as that organization suffered defeat last year at Apollo and this year at Leechburg, the conflicts at both places being very short, as good non-union workmen were obtained with very little trouble, and can be procured now just as easily. What little strength remains in the Amalgamated Association is among the Western sheet mills, and to go into a conflict at this time would likely result in the complete disruption of the organization. That the sheet mill operators would be successful is beyond doubt, as the overcrowded condition of the labor market would allow them to fill up their mills with non-union men in a very short time.

Freight Rates between Pittsburgh and Chicago.—Freight rates on manufactured iron and steel are to be advanced between Pittsburgh and Chicago from 15 cents per 100 pounds to  $17\frac{1}{2}$  cents in carload lots, and from  $17\frac{1}{2}$  cents to 20 cents in less than carload lots. These rates are to go into effect about the 24th inst. Rates have been authorized on cast iron water pipe from Cleveland and Canal Dover to Chicago of \$1 60 per net ton, and to Milwaukee \$2.05 per net ton, effective September 20. West bound rates from Chicago and common points, Mississippi River common points and Missouri River points to Portland, Ore., have been advanced  $7\frac{1}{2}$  cents per 100 pounds on iron and steel articles.



## CORRESPONDENCE.

**The Largest Traveling Crane.**

*To the Editor:* We beg to call your attention to an article appearing on page 443, issue of September 13, of your valued paper, *The Iron Age*. This article reads as follows:

"The crane just completed for the arsenal at West Troy, N. Y., by the Shaw Electric Crane Company of Muskegon, Mich., is claimed to be the largest traveling crane ever constructed. It is of 60 tons nominal capacity, but will easily lift 100 tons. It is 60 feet span and has a lift of 50 feet. It weighs about 80 tons, and six cars were required for its shipment."

Knowing that you desire at all times the facts in cases of this character, we beg to refer you to your issue of *The Iron Age* dated July 12, 1890, wherein you, in a very elaborate manner, illustrated a crane built by us for the Washington Navy Yard, fully describing all its details, capacity, &c.

The crane at the Washington Navy Yard has a total weight within itself of 454,200 pounds, and required 15 cars for its transportation. Kindly compare this weight with that specified by the Shaw Company.

The span of the crane at the Washington Navy yard is 61 feet 8 inches.

Since constructing this large crane for the Washington Navy Yard we have built another, a duplicate in every respect, of practically the same span, for the Watervliet Arsenal, at West Troy, excepting that instead of driving the operations of the crane through the medium of a square driving shaft, it is operated by an 80 horse-power electric motor. At the same time we built for the Watervliet Arsenal two cranes of 30 tons capacity to operate on the same tracks.

For your further information we beg to advise that since building this second large crane for the Watervliet Arsenal, we have constructed several traveling cranes of 60 and 75 tons nominal capacity, of a span of 60 feet, for the Carnegie Steel Company, for serving the large hydraulic press in the armor plate department.

The crane which the Shaw Company now refer to is erected upon the same runways as the large crane and the two 30-ton cranes above specified, and is intended to handle the light work at the lower end of the gun factory, and is for the purpose of relieving the large crane built by us as much as possible from doing the light work.

The bidding on this work was competitive, and as our price was higher than that of the Shaw Company they got the order for the 60-ton crane, but at the same time we got an order for a 30-ton capacity crane of special construction, which was placed in a side wing of the building. We therefore have four traveling cranes in the gun factory in which is located the traveling crane now referred to by the Shaw Company.

MORGAN ENGINEERING COMPANY,  
Per T. R. MORGAN, Jr.,  
Secretary and General Manager.  
ALLIANCE, OHIO, September 15, 1894.

**Handling Blast Furnace Cinder.**

*To the Editor:* Either the writer of the description of the slag machine in use at one of the Cambria Iron Company's blast furnaces, in *The Iron Age* of August 16, 1894, pages 255 and 256, is not posted as to later methods of handling slag, or he purposely

elected to compare the operation of the conveyor described with the system of flat cars and removable boxes which have been discarded by most of the furnaces producing any considerable amount of cinder.

We submit to your readers the query as to which will demand the most repairs, when subjected to the intense heat of the slag or the sharp cutting action of the same (practically a glass) when cold, a strong car truck, like the Weimer, carrying a ladle suitably lined, all the moving parts of which are removed from contact with the cinder, or a conveyor on which the hot slag is discharged to be cooled in transit to the receiving car, with its numerous wearing surfaces?

The writer of the above mentioned description gives \$4700 as the cost of a conveyor and foundation, an amount considerably more than sufficient to equip the largest blast furnace with the latest improved dumping cinder car. If your correspondent based his estimate of saving \$1984 per year upon actual results, the equipment which was displaced must have been sadly deficient. We have constant reports from users of the cinder cars we produce and the average annual repair does not reach \$75 per furnace.

As the locomotive and crew (except when the plant embraces over four blast furnaces) handles other than cinder cars, there is little expense on the dump, and under favorable conditions the cost given by your correspondent for this can be reduced more than one-half.

Where the hot cinder is dripping from flat plates or boxes, railroad sills are rapidly destroyed, but a vessel under control, which tips so as to discharge outside of the sills, does not demand the expense, and the maintenance of track need cost no more for ladle cinder cars than for gondola cars.

As to the furnace labor, there is certainly nothing in favor of the conveyor system over the use of tilting ladles, and the wonderful saving estimated dwindles away.

Taking into consideration the space occupied by slag run in a fluid state from a ladle car and that demanded by common water slag and the advantage of immediately removing the cinder with its dust, heat and steam from about the furnace, allowing for the evident risk of injury by overflowing slag or the cutting of moving parts by the chilled cinder, estimating the possible inconvenience if any part of the conveyor should break and the slag run wild or the damage which a small amount of water and hot iron may cause when coming in contact, we are convinced that the conveyor system when placed immediately at a furnace is not only less desirable but more costly than when properly designed cinder cars are used.

THE WEIMER MACHINE WORKS CO.  
LEBANON, PA., September 8, 1894.

**The Compression of Fluid Metals.**

*To the Editor:* I observe an article in *The Iron Age* of September 6, 1894, read by Ralph Hart Tweddell before the Institution of Civil Engineers. The article reads that Sir Joseph Whitworth was the first gentleman to conceive the idea of the compression of fluid metals. This is not correct. The conception of the compression of fluid metals was first introduced by James Wood, a well-known engineer and millwright of Lancashire, England, who practiced as a consulting engineer in St. Mary's Gate,

Manchester, England, and previous to this was general manager to James Naysmith of Patricroft, near Manchester, and other well-known firms. As I am the eldest son of this gentleman I profess to know something about the truth of this invention for the compression of fluid metals, although it was never patented by my father.

The problem to be solved by James Wood, who was a close and intimate friend of John Barton (who was once the sole owner of the Broughton Copper Works), was to overcome the difficulty he and others had in making copper rollers for calico printers, so that these rollers could be made solid and free from blow holes for engraving. James Wood made his press and put it in operation at the Broughton Copper Works, at Manchester, England, and there made a success in producing the copper rollers by compressing the metal in a fluid state. This press was completed in the year 1856 or 1857 and in the latter part of 1858 he was employed by John Wilkes & Sons, tube works and copper roller makers, of Birmingham, England, to put his press in there to be used for making copper rollers and this was put in operation in 1859. The copper rollers were from 6 to 9 inches in diameter and were cast hollow like the hollow shafts which have been brought into use of late years. I made the tracings from my father's own drawings for this very press.

It was after this that the writer accompanied his father to the Minshull Street Works of Sir Joseph Whitworth's, Manchester, England, to interview Sir Joseph on what he (James Wood) had accomplished. The only difference in the way Sir Joseph Whitworth afterward went to work and treated the fluid metal was by hydraulic, and James Wood treated it by a very powerful screw press, having a very powerful friction clutch to release the gearing when the maximum pressure required was obtained.

It was a very easy matter for Sir Joseph to treat steel for the manufacture of his guns after his interview with James Wood, explaining what he had done in the compression of fluid metals.

James Wood was also the true inventor of other important manufacture, from which others have gained immense wealth, owing to his disposition in not taking out patents—much to the detriment of his family; but to him that deserves credit. Credit is due, if only to his memory, for he died in 1874. It is to my father that I owe a debt of gratitude for my knowledge in mechanical engineering.

WM. H. WOOD.

MEDIA, PA., September 18.

The following incident would be much more highly appreciated by our readers if we were at liberty to give the names of those concerned, but it is good enough for publication without names. A very prominent steel manufacturer, while visiting his agent in Chicago, was asked by a caller how the reduction in the tariff was going to affect his business. Glancing at his agent he replied: "About the only effect I can think of just now is that we will probably have to reduce commissions."

European advices indicate that the gulf between the Standard Oil and Russian oil companies has widened to such an extent that the Russian Minister of Finance has arbitrarily ordered all negotiations for the division of the world's supply between them to terminate.

# The Iron Age

New York, Thursday, September 20, 1894.

DAVID WILLIAMS, - - PUBLISHER AND PROPRIETOR.  
CHAS. KIRCHHOFF, - - EDITOR.  
GEO. W. COPE, - - ASSOCIATE EDITOR, CHICAGO.  
RICHARD R. WILLIAMS, - HARDWARE EDITOR.  
JOHN S. KING, - - BUSINESS MANAGER.

## The Steel Rail Trade.

Soon the iron trade will be on the tip toe of expectation over the movements among the giants of the steel industry, the rail manufacturers. A few weeks since the first thrill went through the industry over a 15,000-ton order for 1895 delivery. Maneuvering for position is beginning, since no one expects that the present pool will be continued without very important modifications of its provisions. New factors will enter the situation for 1895 work. The Lorain plant is not expected to be much of a factor, but the Youngstown mill, now approaching completion, needs to be taken into account, since any tempting difference between billets and rails may induce it to enter the rail trade. Although it does not amount to much in tonnage the Pueblo mill has gone quite far afield lately and has been uncomfortably successful. Then there is the threat of foreign rails in exposed territory on the Gulf and on the Pacific.

Yet relatively these matters are trifling when compared with the attitude of the six great mills to one another. Every one feels certain of its ability to hold its own, and some are confident that they can control their whole territory, in spite of their rivals. One of them has made very important improvements in plant, and another has secured a source of supply of cheap raw material. A third has the advantage of a slightly lower duty on foreign ore. A fourth is feared on account of its extremely aggressive management, and a fifth is serene over the knowledge of heavily reduced cost and a commanding position in the most important center of consumption in the country. During the past year of armed peace preparations for vigorous competition have been going on.

At the head of these great plants, the greatest in the country, stand some of the most sagacious, farsighted and determined of American captains of industry. With the enormous interests confided to their keeping they will not lightly enter a war to the knife, in which all must suffer very keenly. Some new adjustment may be reached, fair to all and modestly remunerative to the industry. The iron trade in general has a deep interest in this matter, since a battle of these giants could not but help influencing adversely many other branches of the trade.

The opinion is widespread in the steel trade that a lower level of prices for rails would prove beneficial to the billet market by increasing the consumption of rails and thus relieving

the soft steel trade from the pressure of unemployed rail capacity. With present prices for raw materials the rail mills could afford to sell at lower prices than those now ruling, provided they had a larger tonnage to produce. That, however, depends more upon the financial ability of the railroads than upon anything else. No one doubts their desire to purchase more heavily, and it is broadly asserted that on many lines of road safety of travel demands extensive renewals. But so many of them have so little money and so little credit that there is not much prospect of a tonnage for next year large enough to tax the capacity of the mills. If one or more of the latter decide that they must have full work, they will have to fight for it vigorously and pay a good price in lessened income for the achievement.

## The Chicago Pig Iron Trade.

The article on the pig iron situation at Chicago which was recently published in *The Iron Age* has attracted much attention and precipitated a good deal of discussion. Those immediately concerned in the Chicago pig iron trade were, of course, conversant with all the facts, but the public generally knew little of the revolution which had taken place in the establishment there of an independent basis of prices. It had been effected so rapidly and withal so quietly, that its significance was not grasped.

The question now comes up, Is this a permanent condition or is it merely temporary? Those who ask this question are influenced to some extent by the knowledge that the Illinois Steel Company are the largest producers of foundry pig iron in the Chicago district and that at present they are having only a limited demand for steel rails, which gives them a great deal of idle furnace capacity. The company have two large steel plants unemployed, which consume a great deal of pig iron when in operation, and the time will come when these works will be needed to supply the demand for steel products. In considering this matter the fact must not be overlooked that the company had just completed four large blast furnaces at South Chicago about the time the depression in the iron trade began, and that these were expected to expand the company's blast furnace capacity beyond the largest requirements from other departments in the busiest times. Not only will the company not again be buyers of Bessemer pig iron from outside producers, as they once were, but they may be expected always to have a good portion of their furnace capacity available for the production of foundry iron.

The Iroquois Furnace Company and the Northwestern Iron Company are independent producers, selling all their pig iron in the open market. In addition to these plants are the Calumet and Minerva furnaces, now idle, but only

awaiting a favorable opportunity to be again put in operation. Consumers' interests are, therefore, bound to be carefully looked after, even when an active market is found for all kinds of iron and steel products.

We have been asked to present in this connection some interesting facts with regard to the price of Bessemer pig iron at Chicago. This is a product which has heretofore ruled higher at Chicago than in other producing and consuming centers. The same influences, however, which brought down the cost of foundry pig iron have likewise affected the cost and the selling price of Bessemer pig iron. Whereas, formerly, Bessemer pig iron at Chicago ruled from \$1.50 to \$2.50 above the price at Pittsburgh, for the past four months Chicago quotations have ranged from 25 cents to \$1.25 below Pittsburgh quotations. This is shown by the following comparison of lowest quotations for the first week of each month this year, taken from our own market reports:

Month.	Pittsburgh.	Chicago.
January.....	\$10.65	\$12.50
February.....	10.50	12.50
March.....	10.40	12.00
April.....	10.35	12.00
May.....	12.10	12.00
June.....	13.25	12.00
July.....	11.50	11.25
August.....	11.75	11.25
September.....	11.50	11.25

These prices, it will be seen, bear no relation to each other whatever. The flurry in Pittsburgh in May and June was not reflected in Chicago, but prices continued on the same level as before and declined in July. The Chicago market was then on an independent basis, and thus it continues to-day. The consumer of Bessemer pig iron in and about Chicago is thus placed in a highly advantageous position for Western trade as compared with the consumer in and about Pittsburgh. In addition to his geographical position he has the benefit of a lower price. Further, the Chicago price given is a quotation on ordinary lots, still lower figures being available by buyers of round lots. These prices have given rise to some surprise at Pittsburgh, where close watch is kept on developments in other parts of the country, and verifications of Chicago quotations have been repeatedly asked.

With such conditions prevailing it is not singular that Chicago expects to continue its growth as a manufacturing center with the revival of general prosperity. It will be remembered that prior to the panic of 1893 there was a remarkable movement of manufacturing establishments to the vicinity of Chicago. Many of these had been attracted by the advantages offered in the way of comparatively cheap raw materials as well as transportation facilities for the distribution of products. For quite a long period from one to three out-of-town manufacturers called nearly every day at the offices of the leading pig iron merchants to obtain points concerning prices of materials and comparative advantages or disadvantages of various localities in the vicinity. Since the panic this has

completely stopped, but there are indications now that the movement will be resumed, and, if it is, a strong factor in starting it will be the exceeding cheapness of pig iron.

### Manufacturers' Reputations.

The reputation of a manufacturer depends not alone upon the quality of his goods but also to a great measure upon the fidelity with which he adheres to the exact terms of contracts made. Prompt delivery is no small item to consumers who depend upon the regular receipt of material to enable them in turn to fulfill their obligations to another set of patrons. It has grown to be quite a common practice, and a most unfortunate one, for manufacturers to defer deliveries on contracts taken at extremely low prices if they see opportunities to sell to other consumers at an advanced price. Plausible excuses are made, of course, in order to satisfy the customer who is made to wait, because it is not the intention to abandon his business but to fill his order as it proves convenient. There are notable exceptions to this reprehensible course of procedure, and the trade in time grows to make discriminations in favor of those who faithfully carry out their contracts even if advances in raw material should cause considerable loss. Instances have cropped out lately in which very low quotations by certain establishments have not secured business that had been confidently expected on such a basis. It was placed elsewhere at a somewhat better price, not on account of quality but because of greater assurance of promptness in delivery. Even if a consumer has the recourse of purchasing from another concern and charging the difference in price to the delinquent manufacturer, he is compensated in very small part for the delay to which he may have been subjected and perhaps for lost opportunities for marketing his own goods.

### PERSONAL.

David Baker, for a number of years in charge of the blast furnace plant of the Maryland Steel Company, at Sparrow's Point, Md., has accepted the post of superintendent of the furnaces of the Lackawanna Iron & Steel Company, at Lebanon, Pa.

Fred. B. Miles of Bement, Miles & Co., Philadelphia, is shortly expected home after an extended European trip.

Frank J. Witherbee of Witherbee, Sherman & Co., Port Henry, N. Y., has returned from Europe.

G. L. Luetscher has been recently appointed superintendent of the open hearth department of the Otis Steel Company of Cleveland.

C. V. Kasson of the Crane Company, Chicago, was recently in London to make arrangements for introducing the Crane elevator in England.

W. E. Dodds, who has been superintendent of the Scott Foundry Depart-

ment of the Reading Iron Company, at Reading, since 1889, returns on October 1 to the E. P. Allis Company of Milwaukee, with which concern he was connected for seven years before he came to the East.

Jay C. Morse, president of the Illinois Steel Company, Chicago, was among the recent arrivals from Europe.

### OBITUARY.

#### ABRAHAM LIEBERMAN.

Abraham Lieberman, one of the most prominent scrap iron merchants in the United States, died at Chicago on the 12th inst., aged 47 years. Mr. Lieberman operated an extensive yard in the heart of the city, at 1461 State street, and a much larger yard at South Chicago, where he carried his principal stock. He was born in Russian Poland, and immigrated to this country in 1868, locating in Chicago, where he joined his fellow countryman Marks Nathan, who also afterward became a very prominent member of the scrap iron trade. Mr. Lieberman entered the iron business in 1871 after the great Chicago fire, became a partner with Mr. Nathan and both prospered until 1874, when the failure of the Milwaukee Iron Company swept away their capital. Mr. Lieberman resumed business in a small way and gradually built up his trade again, ultimately becoming very wealthy, his transactions covering the whole Western field. His reputation for integrity and scrupulous business honor grew with his growth, and in a business noted for sharp practice his word was always unquestioned. He was noted for his kindness to the poor, being open-handed in his charity. During the hard times of last winter he kept a team constantly employed in hauling fuel and provisions, purchased exclusively by himself, to poor families in Chicago who were known by him to be destitute. These dependents on his bounty gathered in great numbers at his funeral and showed their grief by loud lamentations.

#### WILLIAM T. PATTERSON.

William Turner Patterson, known to the hardware trade as the founder of the well-known house of Patterson Bros., 27 Park row, New York, died at Oakland, Cal., September 14. He was born in New York December 28, 1815, and entered the service of the Bank of New York as discount clerk in 1836, making his way eventually to be assistant cashier. Toward the end of his career with the bank, where he remained 20 years, he was offered the position of cashier, which he declined.

In 1848 he established the hardware business at 27 Bowery, furnishing all the capital, his two younger brothers, Edgar C. and Henry A. Patterson, being put in to manage the concern. The two younger brothers had been educated to the business in the old firm of W. N. Seymour & Co., now White, Van Glahn & Co., Chatham square. William T. Patterson retained his position in the bank until 1856, leaving the active management to the juniors, he looking over the books at night. From 27 Bowery the firm moved to larger quarters at No. 13 in the same street, where they were burnt out in 1858. Then they moved to 27 Park row, where they still are. Although nominally interested in the present corporation of Patterson Bros., he had taken no

active interest in the concern since 1872, having spent the greater part of the subsequent period in foreign travel. He mastered several languages to facilitate his journeys. He was a bachelor until 1885, when he married Mrs. Lowry, a widow, of Covington, Ky. Of the two remaining brothers Edgar C. Patterson alone remains actively in the business supervising the books, Henry A. Patterson having been in impaired health for several years.

#### The First Mannesmann Plant.

Co!. Albert A. Pope of Boston, the president of the Pope Mfg. Company, has closed negotiations with Reinhard Mannesmann and his associates, by which the first plant in America for rolling steel tubing by the Mannesmann process is to be erected at Hartford, Conn., adjoining the great bicycle plant of the company. The Pope-Mannesmann Company are to be capitalized at \$750,000, the inventors receiving a portion of the stock in payment for the right to the exclusive use of their process for the manufacture of bicycle tubing and of seamless locomotive boiler tubes up to 2 inch. These two branches of industry have been coupled together, because the manufacture of bicycle tubing is affected by the season demand for wheels, so that the new works will be able to run continuously throughout the year on the two lines of work. We understand that ground for the new works will be broken at once, but that the contracts for the machinery have not yet been closed. The aim, however, will be to get the plant into running condition early next year.

The Mannesmann Company have done quite a large trade in bicycle tubing. We are informed that their sales, which were 400,000 feet in the first year, jumped to 1,500,000 feet in the second year. A few weeks since one contract for 200,000 feet was closed with a Chicago customer, and more recently 300,000 feet were sold in one lot to another bicycle manufacturer. All this tubing, of course, was imported.

It should be understood that the Pope-Mannesmann Company of Hartford will manufacture only the two lines of tubing referred to. Reinhard Mannesmann and his associates retain their interest in the invention so far as it relates to other forms of tubing. For some time past they have been looking over the ground to select a location for a large plant for the manufacture of pipe and tubing for other purposes. They will probably give this matter their prompt attention now, since they are determined to push it.

The last of the machinery for the seamless copper and brass tubing mill for the plant of the Benedict & Burnham Mfg. Company of Waterbury has been delivered this week by the New York shops which have been building it.

Another of the Eastern dippers of black plate announces that it proposes to continue in the business. The concern referred to is the Phillips Tin Plate Company of Philadelphia.

In recently alluding to work done in the Bessemer department of the Colorado Fuel & Iron Company of Pueblo, Col, a mistake was made. In the pair of 5-ton converters the product for August 16 was 815 tons of ingots in 12 hours, not in 25 hours, as reported.

# MANUFACTURING.

## Iron and Steel.

The various plants of the Wheeling Steel & Iron Company, Wheeling, W. Va., were nearly all in operation last week. Those active included the Bessemer Steel plant, skelp mill and forge at Benwood, and blast furnace, plate mill and nail factory of the Belmont plant and sheet mill at the Top Mill and the blast furnace at Martin's Ferry, Ohio. Work is being pushed to complete repairs at the Top Mill blast furnace, and it is expected to resume operations within a short time.

J. J. Spearman of the Spearman Iron Company, Sharpsville, Pa., has entered suit against the Aschman Steel Casting Company, Sharon, Pa., to recover \$6140, this sum being the money advanced to the defendants for the purchase of materials and the payment of operating expenses. E. A. Wheeler of Wheeler Furnace Company, Sharon, Pa., has sued the same concern for \$2000 loaned to them, and \$150 on an engine and fixtures sold them.

The appraisers of the plant of the Maumee Rolling Mill Company, Toledo, Ohio, which is to be offered at receiver's sale this month, placed its value at \$135,000, of which the mill itself stands for \$65,000.

A dispatch from Bellaire, Mich., states that on the 7th inst. the Pine Lake Iron Company were attached on a claim of \$48,000 subject to mortgage.

The New Philadelphia Pipe Works, at New Philadelphia, Ohio, have been put in operation after an idleness of over a year, by the proprietors, James B. Clow & Son of Chicago. The old employees were re-engaged, but at a considerable reduction in wages, which the men accepted with the promise of work throughout the winter. Geo. H. Hopkins of Canal Dover has been engaged as manager of the works.

The factory of the defunct Waukegan Iron & Steel Casting Company, at Waukegan, Mich., has been sold to the American Iron Car Brake Company, who will make a brake invented by John Sanborn, formerly a Northwestern railroad engineer, now superintendent of the car brake company.

The American Tin Plate Company, at Elwood, Ind., and Morewood & Co., at Gas City, Ind., have served notices on the employees of their hot mills department that a cut of 25 to 30 per cent. in wages will be made on October 1, when the reduced tariff on tin plate goes into effect.

The effects of the defunct Muskegon Iron & Steel Company, at Muskegon, Mich., were sold under foreclosure proceedings on the 5th inst. The personal property was purchased by Samuel M. Shimer of Cleveland for \$10,500, including manufactured stock, scrap, tools, office fixtures, &c. The equity in the rolling mill plant proper was sold to Hugh Park, C. C. Billingshurst and Thomas Hume, trustees, for \$1000, subject to mortgage of \$41,547.83. Lots held by the company were bid in by Hugh Park for the trustees for \$250. Subsequently a hitch arose over the method of payment for the personal property by Mr. Shimer, who was therefore unable to secure possession of it, and will institute a contest in the courts. Mr. Shimer says he represents a syndicate heavily interested in the iron industries which stands ready to back the institution up with \$250,000, and that if a satisfactory deal for the real estate could have been made the plant would have been operated.

The Tudor Iron Works, at East St. Louis, Ill., are adding to their boiler plant, which will materially increase the capacity of their rolling mills.

The construction of the new Sylvan Steel Works, at Moline, Ill., is progressing rapidly. The central building is 62 x 170 feet, with an annex on one side 50 x 190 feet and another on the opposite side 50 x 150 feet, with two smaller buildings 47 x 62 feet and 46 x 48 feet. The frame work is wholly of steel and the roof will consist of corrugated steel sheets.

Colorado Fuel & Iron Company of Pueblo are erecting one No. 9 and one No. 5 Whiting patent cupola.

The Lukens Iron & Steel Company, Coatesville, Pa., have decided to build a new engine and boiler house and a building for the housing of the company's gas holders.

The stockholders of the Thomas Iron Company held their annual meeting recently at the office of the company, at Hokendauqua, Pa. The old Board of Di-

rectors were re-elected, as follows: Samuel Thomas, Chas. Stewart, James W. Fuller, William H. Hulick, William P. Hardenberg, B. F. Fackenthal, Jr. and Fred. R. Drake. B. F. Fackenthal, Jr., was elected president of the company, W. H. Hulick vice-president and James W. Weaver secretary and treasurer.

The rolling mill of Morrison, Colwell & Page, at Cohoes, N. Y., has resumed with 200 men after several months' idleness.

No. 2 Colebrook furnace, at Lebanon, Pa., has been making preparations to blow out for the purpose of making repairs.

The Edge Moor Iron Works, at Edge Moor, Del., are now running night and day, with a force of 700 men.

The new rolling mill of the Janson Iron Company, at Columbia, Pa., has been put in operation after undergoing a successful trial heat. The mill contains two heating furnaces and two trains of rolls, and its estimated capacity is 6000 gross tons of merchant bar iron and steel per annum.

Ground has been broken for the foundation of the Longmead Iron Company's new skelp or pipe mill, at Conshohocken, Pa. The contract for the iron building, 70 x 210 feet, has been awarded to the King Bridge Company of Cleveland, Ohio, and will be completed during November. R. S. Newbold & Sons of Norristown secured the contract for the boilers. It will be remembered that the Longmead Iron Company were recently organized with a capital of \$100,000, to purchase the rolling mill property of Jawood Lukens.

Orlando Harvey, master to inquire into the advisability of selling the plant and property of the Wellman Steel Works, at Chester, has filed his report recommending that the plant be sold within 60 days. Judge Clayton confirmed the order, and said that, if nothing be done within 60 days toward settling with the creditors or continuing the plant, a decree for the sale of the works would be issued on November 17.

The Lackawanna Iron & Steel Company will build, in the near future, at Lebanon, a blast furnace, utilizing the greater part of the equipment of the furnace belonging to that company at Franklin, N. J.

No. 3 furnace of the Thomas Iron Company, Hokendauqua, Pa., has been blown out for repairs.

The Indiana Tin Plate Mfg. Company of Atlanta, Ind., were organized on the 11th inst., and the following officers elected: C. A. Ford, president; F. D. Morgan, vice-president and general manager; Dan Goodykoonty, treasurer; E. S. Walton, secretary and assistant treasurer. The company were chartered under the name of the Atlanta Steel & Tin Plate Company. Capital authorized \$150,000. This company were originally incorporated in October, 1892, an eight-stack washhouse was built and in the spring of 1893 the company commenced tinning, but owing to an impossibility to reconcile existing differences between the manager and the company a receiver was appointed, and the plant was recently sold for the benefit of the creditors. It is the intention of the new management to put in three stands of hot and three stands of cold rolls, ample capital having been raised for that purpose, the contracts for the engines, boilers, mill building, pickler, doublers and other machinery having already been let. This company will have the advantage of free natural gas for fuel, and will own 2000 acres of gas territory southwest of Elwood, Ind., being the very best gas territory in the Indiana gas belt. The mill will be arranged on the plan of the New Castle, Pa., plant; the mill building will be 80 x 280 feet; the wash or tin house, 50 x 100; pickling room, 30 x 80, and the assorting and packing room, 50 x 80. All brick and iron work will be commenced at once.

## Machinery.

The Rice Machinery Company of Chicago established a distributive branch in Milwaukee in May, 1893, under the official management of William L. Philips. He is located at 93 West Water street, having a three-story warehouse, 25 x 125 feet, well stocked with all sorts of appliances for the transmission of power. The Milwaukee branch has done an excellent business in equipping local power plants. Contracts have been secured for Lown's factory in South Milwaukee, the Wisconsin Bridge & Iron Company in North Milwaukee, H. S. Snyder in North Milwaukee, the Huntington Mfg. Company in South Milwaukee, Conrad Brothers, Whitnall & Rademaker's coal plant in the Menominee Valley, the

Monarch stone quarry, Milwaukee Chair Company, Bradley & Metcalf Building and others.

The Thomas Iron & Brass Works of Milwaukee, who are removing to Waukegan, Ill., will occupy the buildings erected for the Chicago Safe & Lock Works, a corporation who failed some two years ago.

The Witte Iron Works of Kansas City, Mo., of which E. H. Witte is sole proprietor, have quadrupled their business in the last year. They make a specialty of gasoline engines, mill and elevator machinery and power transmission. Their gasoline engine trade is a development of the past three years. In two weeks recently they sold 19 engines. They are made on a design original with this establishment.

The Riverside Iron Works of Kansas City, Mo., are enjoying marked prosperity. William M. Martin is president of the company, N. M. Martin is vice-president, L. B. Bullene is secretary and treasurer and James Smith is superintendent. The firm are comparatively a new one. They succeeded the firm who used to own the Keystone Iron Works, established away back in the early '60s. It is the oldest works in Kansas City. The new plant was established in 1888. The buildings are 500 feet long and 120 feet wide, and built in quadrangular fashion about an open court. The principal manufacturing work of the shops consists of architectural and ornamental iron work, the making of ice machines and machinery for packing houses and mines. The works are divided into four departments—a foundry, pattern shop, blacksmith shop and machine shop. The establishment have recently manufactured a large ice plant for the Doid Packing Company, a pair of ice engines for the Kansas City Ice & Cold Storage Company. They are engaged at present upon small ice engines for Armour and upon the iron work for the Schulkoph Building at Tenth and Walnut. Their trade is extensive throughout Missouri, Kansas, Texas and Colorado. Their machinery has been shipped as far East as Buffalo and as far West as California. Their ice machines have been set up in St. Louis, in Savannah and other large Eastern and Southern cities. Their work is of such fine quality that their fame is spreading even beyond the bounds of the United States. They are figuring now upon an ice plant for an Australian firm.

The Vilter Mfg. Company are now occupying a new and very substantial plant on Clinton street, between Beecher street and Lincoln avenue, Milwaukee, thoroughly equipped with the most improved machinery. They manufacture improved horizontal and vertical Corliss engines, refrigerating machinery, pumps, heaters, boilers, brewers' machinery, &c., enjoying an export trade as well as a large home trade.

The Excelsior Needle Company, Torrington, Conn., have recently shipped several Dayton swaging machines to foreign countries, some going to England and some to France. These machines are designed for the pointing and reducing of metal, especially wire and tubing, by a cold swaging process, and a large number of them are in use by bicycle manufacturers for tapering tubes. The Excelsior Needle Company also make a variety of bicycle spokes.

The E. W. Bliss Company of Brooklyn report that their European business has been very large. They have shipped to Switzerland within the last two months a special watchmaker's drop hammer, several punching presses fitted with sub-presses for watch work, and a No. 1½ toggle drawing press. A large shipment of tools and machinery for the manufacture of clocks and their cases has gone to Germany, to one of the largest clock making concerns in the world. France has also received a large shipment of tools for the making of granite enameled ware and kitchen utensils. Several watch factories have also been supplied with tools from the E. W. Bliss Company. Austria has received No. 1½ and 3½ toggle drawing presses, No. 18, 19, 20 and 21 adjustable power presses and No. 38½ and 39 power presses with a number of dies, and a No. 161 double action press with dies and special feed for making primers. A large improved automatic perforating press is now nearly completed and will be shipped to England for the manufacture of perforated metals up to 50 inches in width.

The Speeder Cycle Company of New Castle, Ind., are a recent corporation organized for the purpose of manufacturing a patent bicycle. They are now erecting quite an extensive plant, and have just contracted with



the Lodge & Davis Machine Tool Company of Cincinnati, Ohio, for the entire equipment of same, including engine lathes, turret lathes, screw machines, milling machines, grinding machinery, &c.

Whiting Foundry Equipment Company, Chicago, have shipped a No. 3 Whiting cupola to the Abram Cox Stove Company, Philadelphia, and a No. 6 cupola to the United States Radiator Works, Dunkirk, N. Y.

The Yale & Towne Mfg. Company of Stamford, Conn., have received of late orders for electric traveling cranes and other products which they make a specialty of in their hoisting machinery department. One of the last important orders was from A. & P. Roberts & Co. of Philadelphia for seven electric travelers, ranging from 3 to 25 tons in capacity. This may interfere for the present with the removal of this department of their business to some point near Pittsburgh or Cleveland, which that company had in contemplation some time ago.

The Deitz & Schumacher & Co., Cincinnati, Ohio, have fitted up the Moreline Brewery Company and the Cincinnati Electrical Engine Company with new machinery, consisting of lathes and drills.

Byram & Co. of Detroit, Mich., report business steadily picking up. They recently shipped the third Colliu furnace to the Plano Mfg. Company, West Fullman, Ill., and the third Colliu to the McNeal Pipe & Foundry Company, Burlington, N. J. They equipped the new shops of the Howard & Bullough American Machine Company, Pawtucket, R. I., with two Collius, and one 76-inch furnace went to the Johnston Harvester Company, Batavia, N. Y.

The Link-Belt Machinery Company, Chicago, have recently received orders from the following for their Standard water tube safety boilers: 1200 horse-power, Second Avenue Traction Company, Pittsburgh, Pa.; 200 horse-power, Cosmopolitan Magazine Company, New York; 160 horse-power, Swift & Co., Chicago, first order, and 325 horse-power on second order; 200 horse-power, Reliance Building, Chicago; 100 horse-power, Bryan Building, Chicago; 450 horse-power, Midland Hotel, Kansas City, Mo., and 400 horse-power, Lehigh Valley Coal Company, West Superior, Wis.

The Roberts Mfg. Company of Pittsburgh, Pa., manufacturers of conveying machinery of all kinds, have received a contract to put in a complete steam and haulage plant for Mine No. 2 of the Pittsburgh Fuel Company, at Mansfield, Pa.

The Union Foundry & Machine Company of Pittsburgh have received an order from the Citizens' Traction Company of that city for a pair of helical gears of 116 teeth, 13 feet 10 $\frac{1}{2}$  inches pitch diameter, 20-inch face, together with a number of pinions, 10 teeth, having 20-inch face. The same concern have received orders for several large fly wheels, to be furnished to the Clinton Iron & Steel Company of Pittsburgh, and the Montpelier Tin Plate Company, Montpelier, Ind. They are also building for the Superior Steel Company of Pittsburgh a number of tinning machines for tinning cold rolled steel.

The Homestead Mfg. Company, Homestead, Pa., are adding a brass, iron and steel foundry to their plant, which will be in operation in about a month.

Recently the Cleveland Machine Screw Company, Cleveland, Ohio, secured a contract from A. Clement, Paris, France, for equipping his new factory with a ball plant of sufficient capacity to produce 10,000,000 of the bicycle sizes per annum. All of this machinery has been completed and shipped, the final shipment being made during this week. All the latest ideas on the manufacture of steel balls of John J. Grant, engineer for the Cleveland Machine Screw Company, are embodied in this machinery, and it is claimed it will make it the finest plant of its size in the world. The Cleveland Machine Screw Company are about to make extensive additions to their plant, consisting of a new building to contain 25,000 feet of floor space, and a special building about 40 feet square to be devoted to office purposes.

The E. J. Manville Machine Company, Waterbury, Conn., manufacturers of automatic machinery, announce that they have enlarged their facilities for producing small tools for special purposes. This department is in charge of an experienced and skillful designer, who will devise tools for manufacturers of hardware, metal goods and novelties, with the idea of saving cost by adding small tools to the machines already in use.

Theo. Hiertz & Son, St. Louis, Mo., who are sole manufacturers of Nonpareil anti-friction metal, report a heavy demand. They also inform us that they are experiencing a good trade for babbitt metal, car seats, solder, &c.

The Cleveland Stamping & Tool Company of Cleveland, Ohio, are in position to make any size, shape or weight of seamless steel cylinder heads.

The Reading Wood Pulley Company, Reading, Pa., report business brisk with them. Their pulleys have met with a favorable reception at the hands of manufacturers, and the fact that they have recently received orders for pulleys of unusual size from concerns well posted on power transmitting machinery speaks well for their goods.

The extensive coal miners, W. H. Brown Sons of Pittsburgh, Pa., have recently ordered of the Egan Company, Cincinnati, Ohio, one of their latest band sawing machines for the sawing and shaping of ship and barge timbers to such shapes as may be desired. The Brown Sons have extensive boat yards at Brown's Station on the Monongahela River above Pittsburgh some 13 miles, where they build and repair their own coal barges. The machine is a new one and saves much time and labor.

The Delaware Iron Company, a firm growing out of the reorganization of the defunct Burlington Iron Company, have begun operations at Burlington, N. J., with a force of 35 men. The company do a general iron casting business and make a specialty of stove work.

Magill & Co., machinists and hydraulic engineers, have been working day and night for several weeks building the Huber transfer table referred to in *The Iron Age* of August 16. This apparatus appears to combine more novel and valuable features than any other heretofore constructed. The machinery of the Coyne gas generating plant is also being built there, all the work being executed under the supervision of W. F. Harrison, member of the firm of Magill & Co.

The contract for the boilers, tinning machines, pickler, doubler, bran machines, cleaners and furnace castings for the Atlanta Steel & Tin Plate Company has been let to Ford & Donnelly of Kokomo, Ind. This firm have just completed a battery of eight 125 horse-power boilers for the Montpelier Sheet & Tin Plate Company, and are building for that concern ten Thomas & White tinning machines, one pickler, doublers, bran machines, cleaners, furnace castings, &c. They are just completing a battery of boilers for the Irondale Rolling Mill Company, at Middletown, Ind.

#### Hardware.

The Shelton Company, Birmingham, Conn., makers of bolts, tacks and small nails, are putting on the market a line of zinc glaziers' points, both triangular and sharp. These are put up in bulk and in 50 pound cases containing  $\frac{1}{4}$  pound and  $\frac{1}{2}$  pound papers. One of the specialties of this concern is bed screws, which, now that the modern beds do not require them, are used for various purposes, including the holding together of extra heavy cabinets, type setting frames and other heavy furniture.

The Wilcox & Howe Company, Birmingham, Conn., who are well known as makers of carriage hardware, have commenced the manufacture of bicycle forgings in variety. They state they are adding different sizes and styles as fast as orders large enough to warrant new dies are received, and shall extend the line indefinitely.

The bicycle manufacturers in and about Indianapolis are much surprised that their business is keeping up so well. Usually all are shut down in August and September, but now they are running with fair forces, but by no means full handed. The bicycles built in the year ended July 1 are about all sold, and orders are coming in for new ones to an extent never before known at this season of the year. The Munger Bicycle Company are making quite an addition to their present works.

The Derby Cycle Company of Chicago have contracted with the prison board at Jackson, Mich., for the employment of convicts in the manufacture of bicycles, tricycles, &c. The men will be employed on State account—that is, the State builds the machines for the Derby Cycle Company. The contract calls for the employment of 75 men between now and January 1 next. The

old shops formerly occupied by the Fargo Shoe Company will be used.

The L. M. Jones Company, recently organized, under the management of L. M. Jones (for the past 30 years in charge of the wood working department of the Union Hardware Company, Torrington, Conn., and well known to the trade) have located in a commodious building at Robertsville, Conn., where there is abundant water power and a large supply of native lumber, and will manufacture a general line of wood work used by manufacturers of hardware and electrical specialties. They have taken a contract to furnish the wood work needed by the Bagnall & Loud Block Company of Boston, Mass., in the making of tackle blocks, and are prepared to do general work.

D. S. Morgan & Co. of Brockport, N. Y., have decided to wind up their business after a successful life of over 50 years in the manufacture of harvesting machines. The reaper business has been bought by Adriance, Platt & Co. of Poughkeepsie, and the harrow business by E. Bement & Sons, Lansing, Mich. The plant will be closed and stock removed at once.

The Central Stamping Company, with office at 25 Cliff street, New York, are about erecting a five-story brick tinware factory, 75 x 45 feet, estimated to cost \$20,000.

William Machert & Co., Reading, Pa., manufacturers of hardware and the Machert patent chimney cap, have taken possession of their new plant.

The edge tool factory of Taylor & Powell, at Ridgway, Pa., was destroyed by fire a few days since, entailing a loss of about \$15,000, with an insurance of \$6000.

Contract has been awarded for building a new plant for the Charles Scott Spring Company of Philadelphia. The buildings will be one story high and of somewhat irregular shape, being bounded by Canal and New Market streets and Germantown avenue. The main structure will be about 70 x 116 feet.

W. C. Hine, receiver for the Youngstown Stamping Company, Youngstown, Ohio, has just issued his seventeenth statement of affairs of the above concern. It shows that on September 1 there was the sum of \$10,-611.87 on hand, while the business was reported to be in good condition.

#### Miscellaneous.

The Michigan-Peninsular Car Works, at Detroit, Mich., have again shut down, upon the completion of all orders in hand. The company took this action with much regret, stating that they were unable to secure further contracts at present. It is, of course, uncertain how long the works will remain idle.

A company is to be organized in Kalamazoo, Mich., for the manufacture of galvanized iron, having in view as a specialty galvanized parts of windmills, which are so largely manufactured in that vicinity. Those interested are Phelps & Bigelow, Smith & Pomeroy and the Williams Mfg. Company.

The Penn Bridge Company, Beaver Falls, Pa., have received a contract for the erection of an iron bridge across the Susquehanna River from Buttonwood to Plymouth, Pa.

L. M. Morris of Pittsburgh has been awarded the contract to furnish 900 tons of structural material to be used in the erection of the new Pittsburgh Central High School, at Pittsburgh. Also 200 tons for the new Hermes Building on Old avenue, Pittsburgh, together with the structural material for two buildings to be erected on Penn avenue, Pittsburgh, which will require about 600 tons.

The scheme to build at Hiawatha, Kan., a car factory to be conducted on the co-operative plan by a number of the former employees of the Pullman Company and local capitalists, is reported to have progressed far enough to render its consummation certain.

Because the company refused to advance their wages per car from \$9 to \$10 the car builders employed in the Lebanon Mfg. Company's car shop, at Lebanon, Pa., went out on strike.

The Madison Car Works, St. Louis, Mo., after being idle since July 1, 1893, when the company made an assignment, have reorganized, with L. M. Runsey as president, and have resumed operations.

## The Iron and Metal Trades.

An undertone of disappointment is creeping into the market reports from the leading centers, and the outlook is again assuming a somber hue. We have nothing to do with the motives which induce one set of daily newspapers to torture every incident into a proof of unexampled business revival, while another set is industriously at work blackening everything to get a background for high lights in November. The business community wants the truth and that is bad enough without any squinting at politics. The simple fact is that consumption has not expanded enough lately in the Iron trade to keep the active mills from engaging in a continuous scramble for work. As soon as one has drawn back temporarily satisfied another rushes in to replenish an exhausted order book. Back of it all is the haunting fear of the coming winter. Winter work is inadequate, except in particularly good times. What will it be after a dull fall and summer?

It is curious to note that Wall street reckons as a good sign an expansion of production of Pig Iron, when the Iron producer looks longingly to that money center for the first indications of a demand for railroad rolling stock and permanent way. The Iron trade cannot hope for any sustained improvement until the railroad requirements come out.

There is a nervous feeling about Bessemer Pig and Steel Billets. Both have been weakening, but are not down to the level which the rolling mills claim as fair when the current prices of Finished Steel are considered. Buyers figure that cost is as low now as it was when Bessemer was down to \$9.60 @ \$9.75 in the Valleys and Soft Steel Billets were hovering around \$15.25, Pittsburgh. The rolling mills seem to hold that no one has any business to sell above cost, and particularly not the furnaces and the Steel works. An Eastern Pennsylvania mill has turned the tables on the Western mills and carried off the 2200-ton order for elevated work in Chicago. Plates are again demoralized, and very low prices are being made by some of the works. Steel Bars have been selling at unprecedentedly low figures.

Two good inquiries for Steel Rails, one for 7000 tons, New Orleans delivery, and the other for Texas, made English makers smack their lips lately. Both have been snapped up by American mills.

One bright spot is the activity in the Cast Iron Pipe trade, the majority of the shops being busy. This is the result of the fact that municipal bonds have been about the only ones which have sold quite well. This has helped the Southern blast furnacemen particularly. In this connection the sale of a large block of Iron to a Birmingham rolling mill may be mentioned. But when the Pipe season is over, what then?

## Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., }  
PHILADELPHIA, Pa., September 18, 1894. }

Events during the past week have not been favorable to the Iron and Steel trade. A feeling of indifference and weakness is manifested on all sides, so that business can only be done in a small way and at some concession from the prices recently ruling. Consumers appear to be pretty well supplied for the present, and, as new business comes in to them very slowly, it is no easy matter to secure bids for large lots, even though prices may be made attractive. The fact is, the market looks "toppy," and in such cases buyers are disposed to stand aside until it is seen in which direction the turn is likely to be. So far as regards this vicinity the outlook is not very bright. Consumers of Iron and Steel in all their various forms find that new business is not coming in as rapidly as seemed likely two or three weeks ago, consequently buying of material is on a comparatively small scale and usually at inside prices. It is understood that in some other sections of the country business is picking up considerably, which, if maintained, will doubtless enable this end of the line to participate, but we are certainly not in it at present. Compared with last year at this time, there is some improvement, but we are a long way behind normal conditions, and, unless something new develops in course of the next 30 days, the winter is likely to be a very trying one.

**Pig Iron.**—The market is not only dull, but in the majority of cases prices are a trifle lower. Some furnaces are well sold up and are therefore independent of the market temporarily, but to effect sales in quantity there is no alternative but to shade prices. This is not due so much to any special falling off in consumption, but to an increase in the supply, which, it is feared, will be still more emphasized as the season advances. Large lots are not called for at present, although if they were it is probable that anything could be shaded 25¢ @ ton, and even small lots are hard to move at the full figures recently ruling. Bessemer is dull and weaker, notwithstanding the fact that it could be done at 25¢ to 50¢ less than during the earlier portion of the month. General quotations are given as follows for Philadelphia and equivalent deliveries:

Bessemer.....	\$13.25 @ \$13.75
Standard No. 1 Foundry X.....	12.50 @ 12.75
Standard No. 2 Foundry X.....	11.50 @ 11.75
No. 2 Plain.....	10.75 @ 11.00
No. 1 Soft.....	11.50 @ 11.75
No. 2 Soft.....	10.75 @ 11.00
Standard Gray Forge.....	10.50 @ 10.75
Ordinary.....	@ 10.25

**Muck Bars.**—Market dull, with only an occasional sale at \$18.75 @ \$19, f.o.b. cars at sellers' mills.

**Steel Billets.**—Prices are beginning to weaken, and prompt shipments can now be done at \$19.25 @ \$19.50, delivered. For later dates \$18.75 is asked, with a fair chance that the figure could be shaded on the right kind of a bid. Consumers are doing very little, however, so that bids even at low figures are not made with much confidence, the expectation being that there will be a sagging market for some time to come.

**Finished Material.**—The demand is not large, and while some of the mills are doing fairly, others are beginning to get near the end of their orders, and are, therefore, sharp competitors for new business. Inquiries are not large, however, and with the exception of the

regular day to day demand, there is very little coming in, so that the prospect is not encouraging for winter work. Prices are irregular, varying according to size of order, small lots bringing comparatively good figures, but on anything likely to be worth bidding on extremely low figures are made for every description of material. General quotations for small lots are about as follows:

Grooved Skelp.....	1.25¢ @ 1.30¢
Standard Refined Bars.....	1.20¢ @ 1.25¢
Medium quality.....	1.10¢ @ 1.15¢
Tank Steel.....	1.35¢ @ 1.40¢
Heavy Plates.....	1.30¢ @ 1.40¢
Shell.....	1.50¢ @ 1.60¢
Flange.....	1.60¢ @ 1.80¢
Angles.....	1.40¢ @ 1.50¢
Beams and Channels.....	1.50¢ @ 1.60¢

**Old Material.**—There is a continued good demand, but no change in prices. Mills require cheap material to meet the low prices ruling for their product, hence Scrap is taken very freely when it can be had at about current quotations, which are as follows, delivered:

Heavy Melting Steel.....	\$10.50 @ \$11.50
Light Melting Steel.....	8.00 @ 8.50
No. 1 Wrought Scrap.....	10.50 @ 11.50
Machinery Cast.....	9.50 @ 10.00
Wrought Turnings.....	8.00 @ 8.50
Cast Borings.....	6.25 @ 6.75
Old Iron Rails.....	11.50 @ 12.00
Old Car Wheels.....	9.50 @ 10.00

J. W. Hoffman & Co., Philadelphia, have opened an office at 22 William street, New York, and will be pleased to receive proposals for business, same as at their Philadelphia office. This includes Pig Metal, Finished Iron and Steel of all descriptions, as well as construction work, specially bridge and general railway equipments.

The Phosphor Bronze Smelting Company, Limited, of 2200 Washington avenue, have issued their price-list No. 9 on Roll and Sheet Phosphor Bronze, Wire, Circles, Wire Ropes, Cords, Nails, Wire Cloth, Pump Rods, Rolled Bolts, Bolt and Nut Blanks, Washers, Screws, Valves, Ingots, Castings, "Elephant" Alloys and Powder Mill Tools.

## Chicago.

(By Telegraph.)

Office of *The Iron Age*, 59 Dearborn street, }  
CHICAGO, September 19, 1894. }

Freight rates from Eastern points are to be advanced by October 1, and sellers are endeavoring to induce their customers to place as many orders for Finished Material as possible in anticipation of a slight upward movement in prices. It is doubtful, however, whether this will affect any considerable class of trade. The supply at present is so ample that people are not inclined to speculate on the future to any extent, and will take chances on the prevalence of present prices, even after freight rates advance. The most important event of the week was the closing of the contract for the Lake Street Elevated Railroad extension.

**Pig Iron.**—Local manufacturers of Pig Iron have scored another good week. No single transaction exceeded 500 tons, but orders were fairly numerous, and inquirers are still coming in from consumers over a wide stretch of territory. Makers are now stiffening in their views, and some recent sales have been made at advances on previous rates. Orders are even being turned down on buyers' offers which would have been easily accepted only a short time since. A better demand is



noted for Southern Coke Iron in small lots, but particularly from out of town consumers. Southern furnace agents report large inquiries from buyers outside of this immediate vicinity, and therefore a little remote from the influence of local makers. Lake Superior Charcoal Iron still sells in only small lots. Bankrupt stocks of Charcoal Iron are responsible for the inside quotation made in this report. Makers' quotations on guaranteed brands and grades are firmly held. Quotations are given as follows for cash:

Lake Superior Charcoal.....	\$13.00 @	\$15.00
Local Coke Foundry, No. 1.....	10.25 @	10.50
Local Coke Foundry, No. 2.....	10.00 @	10.25
Local Coke Foundry, No. 3.....	9.50 @	10.00
Local Scotch.....	10.25 @	11.00
Ohio Strong Softeners No. 1.....	13.00 @	13.50
Southern Silvery, No. 1.....	.....	.....
Southern Silvery, No. 2.....	.....	.....
Southern Coke, No. 2.....	10.75 @	11.25
Southern Coke, No. 3.....	10.50 @	10.75
Southern, No. 1 Soft.....	10.75 @	11.25
Southern, No. 2 Soft.....	10.75 @	10.75
Alabama Car Wheel.....	17.50 @	18.00
Jackson County Silvery.....	15.50 @	16.00
Other Ohio Silvery.....	14.25 @	14.50
Coke Bessemer.....	11.25 @	11.50
Coke Malleable.....	10.50 @	11.25

**Bars.**—Inquiries are good and sales of small lots are fairly numerous. Now and then a belated buyer places a season contract for agricultural work. The volume of business, however, still falls below the expectation of manufacturers, and competition for business is quite keen. Prices are thus kept low, and it is stated that numerous mills are selling under the actual cost of manufacture. The situation is made interesting by the stiffening in Scrap. It is a question as to whether some of the cheapest sellers will withdraw from the competition, or attempt to force an average in prices. Usual quotations are still 1.05¢ @ 1.10¢, Chicago, on mill shipments of Common Iron from Old Rail mixture, and 1.15¢ @ 1.20¢ on guaranteed Iron. Soft Steel Bars from strictly Billet stock are unchanged at 1.25¢ @ 1.30¢, Chicago, for mill shipments in ordinary quantities. Jobbers are in receipt of an excellent demand from the smaller class of manufacturing consumers, and quote store prices at 1.25¢ upward for Iron, and 1.35¢ upward for Soft Steel.

**Structural Material.**—A little more activity is apparent in daily sales. The most important transaction for the week is the contract for the Lake Street Elevated down town extension, which was secured by the Phoenix Bridge Company. This will require some 2200 tons of material and the bridge company will perform the entire work of building foundations, superstructure, tracks, stations, &c., turning the whole complete to the railroad in 90 days. The work was taken at a very low price. Track elevation by steam railroads is bringing some business. The Lake Shore road is in the market for several heavy bridges to span street crossings. The Drainage Commissioners are now asking for proposals for three large bridges to cross the new canal. Orders are fair for Shapes for building. Quotations for mill shipments, Chicago delivery, are as follows: Beams and Channels, 1.45¢ @ 1.50¢; Angles, 1.40¢ @ 1.45¢; Tees, 1.65¢; Universal Plates, 1.40¢ @ 1.45¢. Small lots of Beams and Channels from stock, 1.75¢ @ 1.90¢; Angles, 1.50¢ @ 1.60¢; Tees, 1.70¢ @ 1.80¢.

**Plates.**—A very good inquiry is reported by merchants. Railroads particularly are buying more largely than has been their custom for a year. Plenty of work of a general character is in sight from a variety of localities. A

feature of the present trade is that all orders entered are for quick delivery. Consumers want their material in a hurry. Prices show no material change. Mill shipments, Chicago delivery, are quoted as follows: Tank Steel, 1.40¢ @ 1.50¢; Flange Steel, 1.65¢ @ 2.10¢; Fire Box, 1.65¢ @ 5¢. Store prices are as follows: Iron or Steel Sheets, Nos. 10 to 14, 1.80¢ @ 1.90¢; Tank Steel, 1.65¢ @ 1.85¢; Flange Steel, 2¢ @ 2.15¢; Boiler Tubes, in carloads, 70 % @ 75 % off.

**Sheets.**—The Sheet trade appears to be in very much better condition than any other branch. The demand for both Black and Galvanized Sheets is more active than ever, and some of the mills have advanced quotations owing to their inability to enter further business for reasonably early delivery. Mill shipments of No. 27 Common Iron are quoted at 2.35¢ @ 2.40¢, Chicago, while Steel is now firm at 2.50¢ and Galvanized Sheets are quoted at 75 and 10 and 5 % off. Sheet Copper is unchanged at 14¢ base in large lots, with concessions to best buyers. Small lots of No. 27 Common Black Sheets from stock are quoted at 2.50¢ @ 2.60¢, and Galvanized Sheets 75 and 5 % to 75 and 10 % off. Jobbers report that their customers have pretty well supplied their requirements for the present and from this time forward only a scattering trade is expected in this line.

**Merchant Steel.**—Quite a tonnage has been entered by mill agents the past week from jobbers and large manufacturing consumers. Specifications are also coming in well on season contracts. Mill shipments, Chicago delivery, are quoted as follows: Smooth Finished Machinery Steel, 1.50¢ @ 1.60¢; Smooth Finished Tire, 1.50¢ @ 1.60¢; Open Hearth Spring Steel, 1.75¢ @ 1.80¢; Bessemer Machinery, 1.40¢ @ 1.45¢; Bessemer Tire, 1.35¢ @ 1.40¢; Ordinary Tool Steel, 5½¢ @ 7¢; Specials, 10½¢ and upward.

**Billets and Rods.**—Sales of both Billets and Rods have been made that will cover the capacity of the local mills for October. A heavy inquiry still exists for Steel, but buyers are endeavoring to force prices lower. The demand is now coming up for deliveries through the remainder of the year. Quotations are unchanged at \$18 @ \$18.25 for Billets, and \$25 @ \$25.25 for Wire Rods.

**Rails and Track Supplies.**—No special developments have occurred since last reported in the Steel Rail trade. Quotations are continued as follows: Standard Rails, \$25 @ \$27; Steel Splice Bars, 1.25¢ @ 1.35¢; Track Bolts, with Nuts, 2.10¢ @ 2.20¢; Spikes, 1.65¢ @ 1.75¢; Links and Pins, 1.65¢ @ 1.70¢.

**Old Rails and Car Wheels.**—Nominal quotations are continued of \$11 @ \$11.25 for Old Iron Rails. Holders are firm and talk higher prices, but consumers are inclined to let matters rest for a time. Old Steel Rails are in some demand at \$7.50 for short pieces and \$10 @ \$11 for long lengths of selected Rails. Old Car Wheels are in some demand with quotations unchanged at \$10 @ \$10.50.

**Scrap.**—More business is doing in Old Material than for a considerable time. Inquiries cover all classes. Dealers quote the following selling prices per net ton: Railroad Forge, \$9 @ \$9.50; Dealers' Forge, \$8.50 @ \$9; No. 1 Mill, \$7; Pipes and Flues, \$6.25; Axles, \$13 @ \$13.50; Heavy Cast, \$7 @ \$7.50; Stove Plates,

\$5 @ \$5.50; Cast Borings, \$3.75; Wrought Turnings, \$5.25; Axle Turnings, \$6.50; Fish Plates, \$10.50 @ \$11; Horseshoes, \$9; Mixed Steel, gross ton, \$5.50; Heavy Melting Steel Scrap, \$7 @ \$7.50.

**Metals.**—Lake Superior Copper maintains its strength and continues to be quoted at 9.50¢ for carload lots. Casting Copper is advancing and quotations have moved up from 9¼¢ to 9½¢ and are now 9½¢, with a good demand reported from consumers. Sales of Pig Lead have been made aggregating 1100 tons at 3¢. If others should come in the market would probably go lower. Spelter is unchanged at 3.25¢ with but little doing.

## St. Louis.

(By Telegraph.)

Office of The Iron Age,  
Bank of Commerce Building,  
St. Louis, September 19, 1894.

**Pig Iron.**—A review of the past week shows some improvement in the demand, but prices as yet have failed to show any additional strength. The increase in production does not tend to improve the situation, and it now looks as if the trade will be able to make their purchases at to-day's prices and perhaps less for the balance of the year. No. 2 Foundry is quoted at \$10.25, f.o.b. cars St. Louis, and it is reported that this price is being shaded. No. 2 Soft and Gray Forge are also referred to as being shaded for desirable orders. Consumers of Iron are not anticipating their wants and are satisfied to cover their requirements 30 days ahead. We quote as follows for cash, f.o.b. cars St. Louis:

Southern Coke, No. 1 Foundry.....	\$11.00 @	\$11.25
Southern Coke, No. 2 Foundry.....	10.25 @	10.50
Southern Coke, No. 3 Foundry.....	9.75 @	10.00
Southern Car Wheel.....	16.50 @	17.00
Gray Forge.....	9.25 @	9.50
Ohio Softeners.....	14.00 @	14.50

**Bar Iron.**—The demand for Bars is excellent and if prices were a little firmer mills would have no cause for complaint. Locally prices are unsettled, which is caused by a local jobber closing out his stock preparatory to removal to another location. This is only temporary, however, and the market is expected to recover as soon as this stock is disposed of. Mills quote 1.10¢ @ 1.15¢. Jobbers ask 1.20¢ @ 1.25¢ for small lots from store.

**Barb Wire.**—There is no improvement to note in the demand for Barb Wire. Texas is a large purchaser of Wire and is usually in the market at this time, but at this writing the demand from that State is not nearly up to expectations. A cut in freight rates might increase the trade, but there is no intimation of a cut being made at present. Prices are not so firmly held. A meeting of the larger mills is being held in Chicago to-day with a view of reducing the output and a consequent advance in prices. Painted is quoted at \$1.80, Galvanized at \$2.20.

**Wire Nails.**—This market continues to show additional weakness. The ruling quotation to-day is \$1.15 for large lots, while \$1.20 @ \$1.25 is quoted for small lots to the country. The outlook for any improvement in prices is to say the least not encouraging.

**Rails and Track Supplies.**—There is a fair demand for Light Rails, but in the way of Standards there are no sales

o report. Old Iron Rails are quoted at \$10 @ \$10.50, and several fair-sized lots have changed hands at about these figures. Steel Rails continue to be quoted at \$26.50 @ \$27. The improvement noted in Track Supplies in our last report continues. The requisitions from railroads are increasing and beginning to assume something like their old time proportion. Prices are unchanged, as follows: Splice Bars, 1.35¢; Spikes, 1.70¢ @ 1.75¢; Bolts, Square Nuts, 2¢; with Hexagon Nuts, 2.10¢; Steel Links and Pins, 1.55¢; Iron, 1.65¢. Standard Rails are quoted at \$26.50 @ \$27; Old Iron Rails are nominally \$10 @ \$10.50.

**Pig Lead.**—This market continues in the unsettled condition last noted. Spot Lead commands 3.05¢ @ 3.10¢, while futures are reported at 2.90¢ @ 2.95¢. There does not appear to be much speculation in the market, and nearly all sales are for actual consumption. The market is far from being strong, and it is impossible to predict the market with any degree of accuracy.

**Spelter.**—In the face of a weak Lead market this metal continues to show considerable strength, and 3.22½¢ @ 3.25¢ is now the ruling price. Consumption is increasing, and a higher range of prices is quite possible.

## Louisville.

LOUISVILLE, KY., September 17, 1894

There continues an increased demand for Iron; purchases largely for prompt shipment, save on the part of Pipe companies, who are disposed to buy for reasonable deliveries. The starting up of car shops is of much interest to the Iron trade, as they are large consumers, and it is indicative of a healthy revival in business in railroad circles. The stove companies are busier than they have been for some time, and some report running full and thoroughly satisfied with their prospects. New furnaces are expected to go in blast, which will overcome the shortage that has existed for certain grades for some time. We quote for cash, f.o.b. cars Louisville:

Southern Coke, No. 1 Foundry.	\$10.00 @ \$10.50
Southern Coke, No. 2 Foundry.	9.25 @ 9.50
Southern Coke, No. 3 Foundry.	8.75 @ 9.00
Southern Coke, Gray Forge.	8.50 @ 8.75
Southern Charcoal, No. 1 Foundry.	12.50 @ 13.50
Southern Car Wheel.	15.00 @ 15.50

## Cincinnati.

(By Telegraph.)

Office of The Iron Age, Fifth and Main Sts. |  
CINCINNATI, September 19, 1894. |

There has been a fair volume of business in Southern Pig Iron during the week, but it was mainly in moderate quantities, seldom running as high as 500 tons from buyers in this district, but some good lots have been sold to the East of Southern Coke Iron and of Lake Superior Charcoal Iron for agricultural work and for Car Wheel works. These Lake Superior Charcoal Irons do not come here, but such low prices are made as to preclude the possibility of Southern Charcoal furnaces competing with them on a profitable basis. The large and strong Coke furnaces in the South are holding prices up well, but some of the others are making concessions to effect sales; thus we hear of No. 3 Foundry selling as low as \$6.75, f.o.b. Birmingham, or on that basis, but it ranges up to \$7. No. 2 Soft continues to be in good request and is selling at \$7.25, but the furnaces are so

well sold already that they are not urging stock on the market. There appears to be a good prospect that all available stocks will be wanted for consumption in the early future. Quotations are as follows:

### Foundry.

Southern Coke, No. 1.	\$10.25 @ \$10.75
Southern Coke, No. 2.	9.75 @ 10.00
Southern Coke, No. 3.	9.00 @ 9.25
Ohio Soft Stone Coal, No. 1.	14.50 @ 15.50
Ohio Soft Stone Coal, No. 2.	14.00 @ 14.50
Lake Superior Coke, No. 1.	12.50 @ 13.00
Lake Superior Coke, No. 2.	11.50 @ 12.00
Hanging Rock Charcoal, No. 1.	16.00 @ 17.00
Hanging Rock Charcoal, No. 2.	15.50 @ 16.00
Tennessee Charcoal, No. 1.	13.00 @ 13.50
Tennessee Charcoal, No. 2.	12.00 @ 12.50

### Car Wheel and Malleable Irons.

Standard Southern Car Wheel	16.25 @ 17.00
Lake Superior Car Wheel and Malleable.	15.25 @ 15.75

### Forge.

Gray Forge.	8.75 @ 9.00
Mottled Coke.	8.50 @ 8.75

## Pittsburgh.

Office of The Iron Age, Hamilton Building, |  
PITTSBURGH, September 18, 1894. |

Last week was the quietest in the Iron trade here for some time. The sharp decline in price of Bessemer Pig seems to have unsettled the market in everything else, and buyers are putting off making contracts in the belief that they will do better later. When compelled to go into the market they buy only enough to satisfy immediate wants and this policy is pursued in everything. Outside of Pig Iron and Steel prices are being maintained fairly well, but rollers of Finished Material say that prices on their product have been at rock bottom right along and that unless they get higher prices for their product or lower prices on raw material they will not be able to come out whole. While it would be a pleasure to chronicle a better state of affairs, the facts are that the outlook is not encouraging, but a change may come when least expected.

**Pig Iron.**—Although Bessemer Pig has declined fully \$1 ¢ ton over the highest prices ruling some time ago, the demand is very light and buyers are holding off in the belief that still lower prices will prevail. They point to the tremendous production now going on and insist that the present demand for Finished Material is not sufficient to take care of it. However, the market takes queer turns sometimes, and a reaction may come when least expected. During the week Bessemer Pig has declined squarely to \$11.25, Pittsburgh, equal to \$10.60 at Valley furnace, and reports are going that offers to sell at a shade under this figure have been made. There is nothing new to report in Gray Forge or Foundry Iron. There is a moderate demand for both and prices are unchanged. We quote as follows:

Neutral Gray Forge. .... \$9.90 @ \$10.00 Cash.  
All-Ore Mill. .... 9.75 @ 10.00 "  
No. 1 Foundry. .... 11.75 @ 12.00 "  
No. 2 Foundry. .... 10.75 @ 11.00 "  
Bessemer. .... 11.25 @ 11.40 "

We note a sale of 1000 tons of Bessemer for close delivery at \$11.25, Pittsburgh.

**Ferromanganese.**—Foreign 80% Ferromanganese has been offered in this market at a shade under \$50, delivered. The price of domestic remains at \$50, delivered at buyer's mill, but it is not improbable that this price would be shaded if necessary in order to keep out the foreign article.

**Billets.**—Business during the week has been exceedingly quiet. The local demand is fair and in connection with old orders keeps the Pittsburgh mills

pretty fully employed, and for Steel for close delivery \$17.25, Pittsburgh, is being asked. For Steel for balance of the year delivery mills outside the Pittsburgh district are quoting about \$16.50 at mill.

**Plates.**—A contract for 450 tons of Bridge Plates for an Ohio bridge concern was secured by a Pittsburgh mill last week. The general demand is good, but on good sized orders very low prices continue to be made by some mills. We quote as follows: Tank Steel, 1.20¢ @ 1.25¢, according to order; Shell, 1.30¢ @ 1.40¢; Flange, 1.35¢ @ 1.45¢; Fire Box, 2½¢ @ 3½¢, according to quality. Our lower quotation on Tank Steel continues to be shaded where round lots are involved.

**Structural Material.**—The heavy demand for Beams and Channels continues, and the outlook could hardly be better. It is claimed that the two local mills are doing nearly the entire Beam business of the country. The contract for the Structural Shapes for the new Pittsburgh High School, involving some 600 tons, has been placed with a local mill. We quote as follows: Beams and Channels up to 15 inch, 1.25¢ in good sized lots and 1.30¢ @ 1.35¢ for small orders. Angles and Universal Plates are ruling at 1.15¢ @ 1.25¢, according to order, and Tees at 1.40¢.

**Merchant Steel.**—The volume of business is light and prices show no improvement. We quote as follows: Bessemer Machinery, 1.25¢ @ 1.30¢; Open Hearth Spring, 1.60¢ @ 1.70¢; Open Hearth Machinery, 1.40¢ @ 1.50¢; Machine Straightened Tire, 1.60¢ @ 1.65¢; Tool Steel, 5¢ @ 7¢ for ordinary grades; 11¢ @ 13¢ for extra grades.

**Muck Bars.**—There is nothing doing, and we make nominal quotations of \$19, delivered, for best grades.

**Bars.**—The demand is only fair and does not compare favorably with last month. The large mills are fairly busy and seem to be taking about all the business offering, while most of the smaller concerns are doing very little. We quote Common Iron Bars at 1¢ @ 1.05¢ and Steel Bars at 1.05¢, with the usual extras.

**Sheets.**—There is an excellent demand for both Black and Galvanized Sheets, and prices seem to be a shade firmer. Some mills are considerably behind in deliveries and have had some orders canceled, which have gone to other mills that could make the deliveries. We quote No. 27 Common Iron Sheets at 2.20¢ and No. 27 Soft Steel at 2.30¢. We quote Galvanized Sheets at 75 and 15 % off.

**Wire Nails.**—The demand is quite active, but is nearly altogether for ordinary lots, the large buyers holding off to some extent until they are assured that bottom has been reached in prices. The weakness in prices referred to last week continues, and \$1 at mill for usual averages has been materially shaded by some mills that are evidently anxious for business. Cut Nails continue in fair demand and we repeat quotation of 95¢ at mill for usual averages.

**Barb Wire.**—The excellent demand ruling for some time past has fallen off to some extent, but is expected to improve after October 1, when the large buyers are expected to come into the market. We quote Four-Point Galvanized at \$2 @ \$2.05 in carload lots at mill. We quote Plain Wire at \$1.25 in carload lots at mill.

**Wire Rods.**—The local mills are pretty well sold up and are not pushing the market for business. We quote at \$23.50 @ \$23.75 at maker's mill. A sale of 2000 tons was made in the Cleveland district last week.

**Skelp Iron and Steel.**—The situation is unchanged, and we repeat former quotations, as follows: Grooved Steel Skelp, 1.05¢ @ 1.10¢; Sheared Steel Skelp, 1.15¢ @ 1.20¢; Grooved Iron Skelp, 1.25¢ @ 1.30¢; Sheared Iron Skelp, 1.35¢ @ 1.40¢, less 2 % cash in ten days.

**Pipes and Tubes.**—The demand for Merchant Pipe is active and the large concerns are quite busy. Prices continue low and depend entirely on the nature of the order.

**Connellsville Coke.**—Out of 17,514 ovens in the Connellsville region more than 14,500 are in blast, and production has crept up to 140,000 tons weekly. The outlook, as far as demand is concerned, is very bright. With a few exceptions all the blast furnaces in the Pittsburgh and Valley districts are active, and this means a heavy consumption of Coke. Prices, however, are very much unsettled, especially on Foundry Coke, and reliable reports state it is being offered as low as \$1 ¢ ton to dealers. A few contracts for Furnace Coke expire on October 1, and offers to renew them for balance of the year at \$1.15 ¢ ton have not been accepted.

## Birmingham.

BIRMINGHAM, ALA., September 17, 1894.

The past week shows no changes of note except to indicate a rather surprising strength in the Pig Iron market. In spite of the large increase in production, stocks are still decreasing and no weakness is noticeable in this district either in inquiries, sales or prices. The resumption of the Birmingham Rolling Mill to-day tends to add strength to the market. A slight tendency is noted to sell more closely at the lower quotations, and fewer sales are reported at the higher figures. The increase in production has eased the congestion of orders, and buyers can more readily obtain quick shipments without having to pay increased prices, as was the case three or four weeks ago when many furnaces were still out of blast.

The heavy demand for Pipe has caused a favorable consumption of the lower grades, of which there was a tendency to stock up. The Pipe works are generally first to feel the general improvement of the market, while Pig Iron is generally among the last articles to advance, hence Pig Iron makers still have a period of patient waiting before they can expect their share of the increase in prices obtained by the Pipe concerns. Finished Material is still in an uncertain state, with tendency to weakness, and does not show enough encouragement in this market to warrant the starting of all the local mills. Work is still pushed on two of the Tennessee Company's furnaces and one of the Sloss Company's, which latter is expected to blow in this week. The demand for Iron here seems to fully warrant the increased output obtained from these three furnaces, though there is no anticipation of higher prices this year.

**Pig Iron.**—Inquiries and sales are reported good. Sales of over 10,000 tons Gray Forge and No. 3 Foundry, to Southern Pipe works, are reported at

prices that will net furnaces current figures. A local mill has bought 10,000 tons Gray Forge and No. 3 Foundry at current rates, net. As the make of these grades has not been heavy these sales will keep them out of stock for some time and tend to make prices firm. Smaller orders are plentiful, mainly for carload to 500-ton lots. Several 1000-ton lots are shown at current prices. In one case sales have averaged over 2000 tons a day for the week. The demand for quick shipment is still in excess of supply, on No. 2 Foundry and Soft grades. The latter are scarce. There is no tendency to make sales beyond six months; none are reported over this period. Western shipments still exceed those to Eastern territory, and sales to Chicago and adjacent territory of over 2000 tons are reported at current rates—mainly Soft and No. 2 Foundry. Stocks are light, No. 1 Foundry alone showing a tendency to stock up. Speaking of stocks, order books show unfilled sales to be over six times the amount in hand and equal to nearly six months' production, added to present stocks. The reduced freight rates expire by limitation October 1. A rise of 25¢ ¢ ton is expected Eastward. Westward no definite information is as yet to hand. Average quotations run as follows: No. 1 Foundry, \$8 @ \$8.25; No. 2 Foundry, \$7.50 @ \$7.75; No. 1 Soft, \$7.50 @ \$7.75; No. 3 Foundry, \$7; No. 2 Soft, \$7.15 @ \$7.25; Gray Forge, \$6.50 @ \$3.75.

## New York.

Office of *The Iron Age*, 95-102 Reade street, New York, September 19, 1894.

**Pig Iron.**—No improvement in the volume of the demand has yet come in this market, and the situation remains disappointing. We quote standard brands \$12.50 @ \$13 for No. 1; \$11 @ \$12 for No. 2, at tidewater. Southern Iron, same delivery, \$11.50 @ \$12 for No. 1; \$11 @ \$11.25 for No. 2; \$10.35 @ \$10.50 for No. 3; \$10.75 @ \$11 for No. 2 Soft, and \$11 @ \$11.25 for No. 1 Soft. Foundry No. 4 (Foundry Forge) is \$9.75 @ \$10.25.

**Spiegeleisen and Ferromanganese.**—No business is reported and the market remains nominally \$20.50 @ \$21 for foreign 20 % Spiegeleisen and \$49 @ \$50 for 60 % Ferromanganese, tidewater.

**Billets and Rods.**—The market for Billets is weaker. We quote nominally \$18.75 @ \$19 for Billets and \$26 @ \$26.50 for Wire Rods, tidewater.

**Steel Rails.**—English makers have been figuring on an order for 7000 tons, New Orleans delivery, and another for Texas, but in both cases the work was placed with American mills. We discuss the Steel Rail situation editorially.

**Track Material.**—We quote as follows for small lots: Spikes, 1.50¢ @ 1.70¢; Fish Plates, 1.20¢ @ 1.40¢; Track Bolts, Square Nuts, 2¢ @ 2.10¢, and Hexagon Nuts, 2.10¢ @ 2.30¢, delivered.

**Manufactured Iron and Steel.**—No work of any magnitude has been given out in this market during the week. We quote: Beams up to 15-inch, 1.35¢ @ 1.50¢ for round lots; Angles, 1.30¢ @ 1.35¢; Universal Mill Plates, 1.25¢ @ 1.35¢; Tees, 1.50¢ @ 1.60¢; Channels, 1.40¢ @ 1.50¢, on dock. Steel Plates are 1.30¢ @ 1.40¢ for Tank; 1.40¢ @ 1.50¢ for Shell; 1.60¢ @ 1.65¢ for Flange, and 1.75¢ @ 2¢ for Fire

Box, and 2¢ @ 2.25¢ for Locomotive Fire Box, on dock; Refined Bars are 1.25¢ @ 1.9¢, on dock, and Common 1.10¢ @ 1.20¢; Soft Steel Bars are 1.15¢ @ 1.30¢; Scrap Axles are quotable at 1.35¢ @ 1.50¢, delivered; Steel Axles, 1.35¢ @ 1.50¢, and Links and Pins, 1.40¢ @ 1.60¢; Steel Hoops, 1.40¢ @ 1.50¢, delivered; Cotton Ties, 67¢ @ 75¢ ¢ 45-lb bundle, tidewater; Machinery Steel, 1.20¢ @ 1.40¢; Toe Calk, 1.70¢ @ 1.90¢, and Sleigh Shoe, 1.55¢ @ 1.75¢, delivered.

**Old Material.**—There is some demand for export, for Old Iron Rails, but prices here and freights are too high to allow of any business being done. Italy is not asking for Old Steel Rails at present, and prices are held too high to make sales possible.

The National Structural Tubing Company, who have recently opened offices at the Potter Building, this city, have appointed as agents F. K. Bowes of 8 Exchange, Grand Pacific Hotel, Chicago; Holland Company, Hamilton Building, Pittsburgh, and Justice Cox, Jr., 218 South Fourth street, Philadelphia. The Tubing is a new product intended to take the place of the ordinary welded Tubing in structural work. Not being welded, it is sold at a considerably lower price.

## Financial.

Financially regarded, the week under review has presented few features of interest, nor does the present condition of general business exhibit any notable change from that outlined in last week's report. In most lines trade shows a marked improvement over that of a month ago, while in some the increase is still slight. On the whole, the growth of business since the going into effect of the new tariff has not equaled the expectations previously formed. That there has been a real and growing expansion, however, is evident from the returns of bank clearances of all the clearance houses of the United States, which for the week ending Saturday last were \$882,168,869, against \$809,244,051 in the previous week and \$803,126,975 in the corresponding week of last year, an increase of 9.8 %. Still, as compared with the corresponding period of 1892, the decrease is still very marked, amounting to about 25 %.

The most important circumstance bearing on the general business of the country is the serious shortage in the corn crop, the amount of which is variously estimated from 1,000,000,000 bushels to 400,000,000 bushels. The Government crop report, issued last week, calculates the aggregate corn crop at between 1,100,000,000 and 1,200,000,000. All independent estimates are, however, very much higher than those of the Government, which are, as a rule, notoriously unreliable. The Cincinnati *Price Current* calculates the yield of corn at from 1,400,000,000 to 1,500,000,000 bushels, while other authorities place it still higher, the most favorable estimate being 1,657,000,000 bushels. In any case, nevertheless, the fact remains that a serious deficiency in the corn crop is inevitable. This fact will have a detrimental effect on railroad earnings in the West, and, by reducing the purchasing power of the farmers, on business generally.

Speculation in stocks during the week has been very dull and is still confined to the "professional" class of traders. The public at large continues to hold

itself aloof from the stock market. Interest has been almost entirely confined to the "industrial" issues, which have practically provided the entire excitement for an otherwise exceedingly dull week. "Sugar," "Whisky," and Chicago Gas have all exhibited extraordinary fluctuations, ending in sharp declines of  $9\frac{1}{2}$ , 5 and  $6\frac{1}{2}$  points, respectively, from the prices of a week ago. In company with these bigger trusts, the smaller industrials, as Tobacco, Leather, Lead, Cotton Oil and others, have experienced sharp falls, the whole list showing a loss. These declines, however, have in no way affected the financial situation, being probably the work of "insiders" for their own individual benefit. Sugar's fall, for instance, from 105 to  $95\frac{1}{2}$ , appears strange and unaccountable in any other ground than inside manipulation, for, last week, the full dividends on both preferred and common stock were declared. It is said that the statement read at the meeting of the directors showed cash and cash assets in excess of \$18,000,000, and earnings in the fiscal year for the common stock exceeding 30%. The net returns for the six months ending August 31 were reported as being the best in the company's history.

Railroad shares have been almost entirely neglected and exceedingly dull. St. Paul's quarterly dividend of  $1\frac{1}{2}\%$  was declared on Thursday last on the preferred stock, and 2% semi-annual on the common stock. This circumstance gave tone to St. Paul, which was followed by some considerable London buying of this stock toward the end of last week, and by a greater firmness in the whole granger group. On Tuesday transactions in St. Paul reached the unusual total of 35,000 shares, but otherwise the whole line of railroad stocks have remained inactive, though strong. Northern Pacific preferred fell  $4\frac{1}{2}$  points at the close of last week, owing to the shorts having all covered at the recent rise. The stock has recovered somewhat this week. The market closed dull and irregular on Wednesday.

The strength and activity which marked the bond market during the week ending last Saturday has been followed by a reaction in the early part of the current week. Railroad bonds have been quiet and irregular, with some weakening in prices. The Reading issues have been particularly weak, and with some others exhibit a decline. State and municipal bonds have been fairly active. Government bonds have been quiet and firm. Closing prices on Wednesday were quoted as follows:

	Bid.	Asked.
2's, 1891, registered.....	96	96
4's, registered.....	114	114 $\frac{1}{2}$
4's, coupon.....	115	115 $\frac{1}{2}$
5's, registered.....	119 $\frac{1}{4}$	119 $\frac{1}{2}$
5's, coupon.....	119 $\frac{1}{4}$	119 $\frac{1}{2}$

The market for sterling exchange advanced sharply early in the week under review, putting an end temporarily to the expectations of gold importation, but a reactionary tendency set in on Tuesday, owing to a falling off in the demand and a considerable increase in the supply of commercial bills. Actual business was done on Wednesday at \$4.85 $\frac{1}{2}$  @ \$4.85 $\frac{1}{2}$  for 60 days, \$4.86 $\frac{1}{2}$  @ \$4.86 $\frac{1}{2}$  for demand, \$4.86 $\frac{1}{2}$  @ \$4.86 $\frac{1}{2}$  for cables and \$4.84 $\frac{1}{2}$  for commercial.

Domestic exchange on New York is quoted as follows: New Orleans, commercial, 75 discount; bank, par; Savannah, buying  $\frac{1}{8}$  discount, selling  $\frac{1}{8}$  premium; Charleston, buying at  $\frac{1}{8}$  discount, selling par; San Francisco, sight 12 $\frac{1}{2}$ , telegraph 15; Boston, 15 discount; Chi-

cago, 40 @ 50 discount; St. Louis, 40 discount @ par.

Saturday's bank statement was again a favorable one, showing an increase in loans of nearly \$3,500,000. This reflects a better demand for money in commercial circles and also for the moving of crops. Specie increased \$579,400, and legal tenders decreased \$1,846,400. Deposits increased \$2,854,300, and circulation increased \$203,100. The surplus reserve decreased \$1,980,575, the surplus now standing at a little under \$60,000,000.

There has been a somewhat improved offering of commercial paper, although business is still below the average. The supply of choice paper continues inadequate to the demands of local and out of town buyers. Quotations are  $3\frac{1}{2}\%$  @  $3\frac{1}{2}\%$  for 60 to 90 day bills receivable;  $3\frac{1}{2}\%$  @  $4\%$  for four months' commission house names;  $3\frac{1}{2}\%$  @  $4\%$  for prime four months' single names;  $4\%$  @  $4\frac{1}{2}\%$  for prime six months of the class, and  $4\frac{1}{2}\%$  @  $5\frac{1}{2}\%$  for good four to six months' single names. Call loans are still quoted at 1%, and borrowers are inclined to supply their wants in this market rather than to contract for time loans. Time money is still offered in abundance and collateral is not too keenly scrutinized. Rates are quoted at 2% for 60 days,  $2\frac{1}{2}\%$  for 90 days, 3% for four months,  $3\frac{1}{2}\%$  for five months, and  $3\frac{1}{2}\%$  @  $4\%$  for longer periods.

Bar silver is quoted in London at 29 $\frac{1}{2}$  pence and in New York at 63 $\frac{1}{2}$ ¢, nominal, 3 ounce. Shipments Eastward from New York during the week have aggregated some 850,000 ounces.

There has been a gain of about \$1,400,000 in the Treasury gold reserve in the past week, and the officials regard the future with equanimity, believing the gain will continue, especially as a great scarcity of small bills exists. The gold reserve now stands at nearly \$59,000,000.

East bound shipments from Chicago last week were 51,528 tons, against 44,183 tons the week before and 52,493 tons in the corresponding week of last year. West and South bound shipments also exhibit a considerable increase. Railroad earnings thus far reported in September show rather more decrease, compared with 1892, than August earnings. For the first week of September the aggregate of gross earnings of all roads in the United States showed a decrease of 1.3% compared with the corresponding week last year and 15.9% compared with 1892. At this time last year, however, passenger earnings were increasing on account of the World's Fair traffic.

In the following table, published in *Dun's Review*, the aggregate of gross earnings of all roads in the United

	September.			August.		
	1894.	Percent.	1892.	1894.	Percent.	1892.
Trunk lines.....	\$1,045,112	- 6.4	-11.9	\$8,440,747	+ 2.8	- 7.3
Other Eastern.....	131,785	- 3.7	- 0.1	1,168,965	+ 1.1	+ 1.3
Grangers.....	661,103	+ 7.0	- 8.8	4,970,281	- 2.9	-15.9
Other Western.....	600,051	-10.6	-9.3	4,291,983	+ 8.0	- 6.4
Southern.....	1,160,757	+ 9.9	- 5.9	5,710,953	+ 3.7	- 7.6
Southwestern.....	1,758,013	- 5.9	-26.3	8,398,330	+ 3.6	-21.7
Pacific.....	478,092	+ 7.6	-16.5	3,320,675	+13.0	+ 3.4
United States.....	\$5,834,913	- 1.3	-15.5	\$36,301,904	+ 2.3	-11.5
Canadian.....	381,060	-10.8	-10.4	1,610,000	-12.9	-12.0
Mexican.....	275,202	+12.6	+ 0.1	1,284,194	+10.4	- 0.9
Total all.....	\$6,491,115	- 1.4	-16.0	\$39,196,098	+ 1.8	-11.2

States reporting for the periods mentioned is given. The roads are classified according to sections or classes of freights. Canadian and Mexican roads are printed separately. The figures for 1894 only are printed, together with the percentage of gain or loss compared

with the corresponding time last year; also the percentages of loss compared with 1892.

## Metal Market.

**Pig Tin.**—Since our last review prices for Straits Tin have advanced sharply. On spot stock there is a clear gain of 0.35¢ @ 0.40¢. September delivery, seller's option, is up about 0.60¢, October nearly as much and distant future deliveries 0.50¢ @ 0.60¢. Official records show transactions of about 500 tons. Quite as much, if not more, Tin has changed hands privately. In short, the week has been quite a lively one, and, while it is no secret that manipulation has kept a lively interest, convincing evidence is presented that fully if not more than the usual amount of stock has passed from importers' hands into the channels of consumption. Arrivals have been heavy, however, and doubtless close in line with the distribution. The shipments from the Straits during the first half of the month were quite large also, including 1700 tons to London, 450 tons to the United States and 360 tons to the Continent, against a total of 1475 tons during the corresponding period last year. This keeps the visible supply at or above 20,000 tons, and it is plain that the strength of the market is due more to speculative maneuvering than to statistical position, although helped to some extent by good purchases by dealers and consumers. Latest dealings were at prices on the basis of about 16.55¢ @ 16.60¢ for spot. September delivery was 16.45¢ asked.

**Copper.**—Prices have been raised to 9.50¢ for Lake Superior Ingot, 9.30¢ @ 9.35¢ for Electrolytic, and about 9.25¢ for common casting stock. It is asserted that all the Lake Ingot obtainable at 9.50¢ or under, for delivery during the balance of this year has been purchased and that quite extensive sales have been made of Wire Bars and other Electrolytic Copper. Sales of casting stock, it is also asserted, reach a liberal total. Another bullish feature comes out in the form of reports that the agreement to restrict production has been perfected, but convincing evidence in this connection is lacking. It would seem, however, that there is a "bull" interest in the market, but it is probably more in the nature of a speculative syndicate than a combination of producers, with manipulations adjusted to govern prices on both sides of the Atlantic for purposes not difficult to imagine. Aside from speculative doings, it is clear that consumption is proceeding at a rate that helps the market considerably.

**Pig Lead.**—The situation at this writing is practically the same as it was a week ago. There is no chance for export business at prices that would net the shippers more than 2¢ @ 3¢ lb. That fact, along with the rather large output, causes home consumers to be



quite independent, and it is therefore difficult to secure bids above 3¢ for round lots of common Western for near future delivery. There are some sellers at 3.10¢ for October and later shipment, but 3.15¢ is generally asked. During the early part of the week under review quite a good business was put through at or near the lower rate quoted. Less interest has been manifested in foreign Lead, and the chances are against business at better prices than those quoted for domestic.

**Spelter.**—Higher prices for ores and alleged curtailment of production have, in connection with smaller offering, served to stiffen prices somewhat. As matters stand, 3.50¢ would seem to be inside rate for ordinary Western brands, in carload or larger lots. Only routine business has been effected here, however, and the Eastern demand generally is spiritless.

**Antimony.**—A moderate business has been effected and prices are still rather easy, with 7½¢ quoted for Hall's and 9½¢ for Cookson's.

**Nickel.**—Prices are about 38¢ @ 40¢ for ordinary quantities and the market is slow.

**Tin Plate.**—Spot business is strictly of retail character, since buyers will take nothing beyond what they are forced to in view of the fact of the new duty going into effect shortly. Some very fair purchases have been made for October and later delivery, but the volume of business is below expectations and prices have not turned for the better, despite firmer tone to foreign advices. For October and later deliveries the prices quoted are as follows: Charcoal Tins: Melyn Grade, ½ X, IC \$4.65, IX \$1.50 extra; Grange Grade, IC \$4.20, IX 90¢ extra; Allaway Grade, full weight, IC \$4.15, IX 75¢ extra; Allaway Grade, 100 lb, IC \$4.05, IX 75¢ extra. Siemens Steel (Squares, &c.): Full weight, IC \$4.10, IX 75¢ extra; 100 lb basis, IC \$3.95, IX 75¢ extra; 95 lb basis, IC \$3.87½, IX 75¢ extra. Bessemer Steel (Squares, &c.): Full weight, IC \$4.05, IX 75¢ extra; 100 lb basis, IC \$3.85, IX 75¢ extra; 95 lb basis, IC \$3.80, IX 75¢ extra. Coke Tins, IC 14x20: Siemens Steel, full weight, \$4.05; Siemens Steel, 100 lb, \$3.90; Bessemer Steel, \$3.95; Bessemer Steel, 100 lb, \$3.80; Bessemer Steel, 95 lb, \$3.67½; Bessemer Steel, 90 lb, \$3.60. Charcoal Ternes: M. F., IC 14 x 20 \$5.70, IC 20 x 28 \$11.40; Old Style Pontymister, IC 14 x 20 \$4.95, IC 20 x 28 \$9.90; Worcester, full weight, IC 14 x 20 \$4.27½, IC 20 x 28 \$8.55; Worcester, 100 lb, IC 14 x 20 \$4.15, IC 20 x 28 \$8.30; Ely, Lily, Dyffryn, IC 14 x 20 \$4.10, IC 20 x 28 \$8.20; Alyn, full weight, IC 14 x 20 \$3.85, IC 20 x 28 \$7.70; Alyn, 100 lb, IC 14 x 20 \$3.75, IC 20 x 28 \$7.50; Alyn, 95 lb, IC 14 x 20 \$3.70, IC 20 x 28 \$7.40; Dean, full weight, IC 14 x 20 \$4.95, IC 20 x 28 \$7.90; Dean, 100 lb, IC 14 x 20 \$3.87½, IC 20 x 28 \$7.75; Dean, 95 lb, IC 14 x 20 \$3.82½, IC 20 x 28 \$7.65; D. R. D. Grade, full weight, IC 14 x 20 \$3.80, IC 20 x 28 \$7.60; D. R. D. Grade, 100 lb, IC 14 x 20 \$3.70, IC 20 x 28 \$7.40.

The monthly production of Copper in the United States has been as follows, according to John Stanton, the first column giving the aggregate returns from the reporting mines, which include the principal Lake, Montana and Arizona producers; the second being the metal from pyrites and from a number of smaller outside sources, being estimated:

American Product.			
	Reporting mines. Gross tons.	Outside sources. Gross tons.	Total. Gross tons.
Second half 1892.....	59,239	6,287	65,526
First half 1893.....	62,470	6,478	68,938
Second half 1893.....	67,290	6,252	73,542
Totals 1893 .....	129,760	12,730	142,490
1894.....			
January.....	10,832	1,340	12,172
February.....	10,245	1,340	11,585
March.....	13,759	1,340	15,099
April.....	12,475	1,340	13,815
May.....	12,669	1,340	14,008
June.....	13,972	1,340	15,312
First half 1894.....	73,951	8,040	81,991
July.....	12,639	1,340	13,979
August.....	11,815	1,500	13,315
The product of the foreign reporting mines and the United States exports were as follows:			
	Foreign reporting mines. Gross tons.	United States exports. Gross tons.	
Second half 1892.....	39,655	17,980	
First half 1893.....	41,048	20,361	
Second half 1893.....	40,647	60,031	
Totals 1893 .....	81,495	80,392	
1894.....			
January.....	8,145	7,717	
February.....	7,217	5,590	
March.....	6,922	7,137	
April.....	7,345	6,209	
May.....	8,013	6,140	
June.....	7,611	6,976	
First half 1894.....	45,293	39,769	
July.....	6,960	7,226	
August.....	7,367	6,408	

## British Metal Market.

[Special Cable Dispatch to The Iron Age.]

LONDON, September 19, 1894.

Pig Tin market has been active, somewhat irregular, but, upon the whole, quite strong, with business in prompts at as high as £73. 2/6. From that there was a reaction to £71, owing to lack of support, but subsequently recovered on purchases by the syndicate and for American account. Toward the close the market became very active and excited, owing to manipulation by the syndicate operators, who continue to buy with a view of controlling the supply. Consumption is good and helps the deal somewhat. Straits shipments the past fortnight were 2500 tons. At the close the market was quite firm with Straits quoted at £73. 17/6 for prompts and £74 for three months' futures.

Copper has advanced sharply. Merchant Bars sold up to £41. 13/9 for prompts. A fair business was done early in the week at improved rates, dealers expecting lessened American supplies owing to rumors of combination of mining interests. Improved speculative interest, together with better business with consumers, caused large buying, particularly of futures. Spot stocks decreased 208 tons, and the visible supply 60 tons during the past fortnight. Chili charters were 900 tons. At the close Chili Bars were quoted at £42 for prompt delivery and £42. 5/ for three months' futures. Best selected English, £44.

Tin Plate has been in active demand. The call was chiefly for light weight Cokes. Actual business has been dis-

appointing, however, as buyers are hesitating, owing to uncertain course of the market. Where business has been done prices averaged 1½ pence lower, in the face of dearer Pig Tin. Bessemer Wasters have been in very fair demand. There has been a better demand from Canada. Swansea quotations are as follows:

Bessemer Cokes, IC..... 10/8 @ ....  
Siemens Cokes, IC..... 10/8 @ ....  
J. B. Steel Cokes, IC..... 10/8 @ ....  
Dean Ternes, 20 x 28 .. 22/ @ 23/  
Charcoals, IC..... 11/6 @ 12/6

Pig Lead is dull, with sellers at £9. 17/6 for soft Spanish.

Spelter is steady at about £15. 10/ for ordinary Silesian, but there is only a moderate business.

## Tin Plate Wages.

(By Telegraph.)

PITTSBURGH, PA., September 19.—John Jarrett, secretary of the Tinned Plate Manufacturers' Association of the United States, has been notified by M. M. Garland, president of the Amalgamated Association, that the vote among the members employed in tin plate and black plate mills on the proposition of the manufacturers to make an average reduction of 25 per cent. in wages on account of the reduction in the duty on tin plates and black plates has been finished. The men voted unanimously not to accept the reduction, but will offer a counter proposition in a few days agreeing to accept a cut of about 10 per cent. The manufacturers insist that they must have a reduction of fully 25 per cent., and unless they secure it they will operate with non-union men. A few plants in Ohio and Indiana are closed pending adjustment of the wage scale and to make repairs. A meeting of the tin plate manufacturers will be held in Pittsburgh in a few days to take action on the rejection of their proposition. At present it looks very much as though a strike will take place.

A. S. Hay of Naylor, Benzon & Co., London, now in this country, notes a curious development in one department of the iron ore trade abroad. The rapid expansion in the introduction of the basic process has brought it about that a higher price is being paid for ores high in phosphorus than for similar material carrying less of that element. Phosphorus, once cursed as the "devil" in the steel trade, is now actually sought as a friend.

Gossip in the metal trade has it that Strauss, the great Tin king, is actively opposing the clique which is trying to corner Tin. The arch manipulator now is one Rickard, who is backed by an influential firm. It is variously estimated that the clique have already accumulated from 7000 to 13,000 tons of Tin. Little confidence is expressed in the success of the movement. It is stated that this country is singled out for the dubious distinction of having the metal unloaded on it. It is easy to buy and run up the price, but the selling at a profit is quite another matter.

# HARDWARE.

## Condition of Trade.

**T**HE REPORTS given below reflect the evident improvement in the different business centers to which they relate. It is apparent that while business has not yet in most lines reached its normal volume, the trade are purchasing more freely to meet the demand which is setting in from their customers, and to prepare for the business of the next month or two. It is an encouraging sign that Mechanics' Tools are beginning to move more freely, and that general Hardware is also in increasing demand. Some manufacturers report the business of the month thus far as being very satisfactory and larger in volume than they had reason to expect. In prices there is little improvement to note. Most goods continue low, and prices in many cases are somewhat irregular. In regard to collections little complaint is made.

### Chicago.

(By Telegraph.)

Shelf Hardware keeps up fully to its former volume, and local jobbers are continuing to extend their territory. The demand is not so largely now for season goods as for general Hardware. Orders are covering the entire range of goods. Cutlery is in excellent demand. Tin Plates are slowly giving way in anticipation of the reduced duty on October 1. In a few cases purchases may be made at the full reduction expected after that time. Heavy Hardware runs along at about the same satisfactory gait. Carload orders for Iron and Steel are more numerous. The Wagon and Carriage trade is inclined to quietness, but a few contracts are being made for materials for delivery next year. Railroad companies are more liberal buyers now than for a year past. The supply houses report a steady gain. August showed a marked increase over July and this month is in the same manner showing an increase over August. Iron and steel merchants also feel the influence of a better demand from their railroad customers. Still, as compared with trade two years back the volume of business of this character is comparatively light.

### St. Louis.

(By Telegraph.)

The month of September gives promise of being the best month of the year. The demand is of an exceptionally heavy character and all the jobbers

report the same conditions prevailing. The South and Southwest have had the best crops for years, and as a result are buying very heavily. Shelf Goods, Heavy Hardware, Ammunition, Shovels, Tinware, Preserving Kettles and Jars, Stove Pipe, Elbows and Boards and general House Furnishing Goods are included in nearly every order. The disposition to stock up is becoming more pronounced and jobbers are compelled to increase their orders to manufacturers to keep their stocks up. Prices in nearly all lines are well maintained, and as they are believed to be as low as they can go any change will be for the better. This applies to all lines of goods with the possible exception of Wire Nails and plain Wires, which are being sold at prices which are generally believed to be close to cost.

### Cleveland.

**THE W. BINGHAM COMPANY.**—The improvement noted in our last has made no retrogradation. It still continues, and while the increase of business as compared with the same weeks of last year is not quite so marked in September as it was in August, still it is very appreciable. Prices continue without much change, Wire and Nails still being weak with only fair demand. We notice an improvement in orders for mechanical tools, which is always an indication of better business. Season goods are selling well. The advanced prices on Stove Boards, however, have put somewhat of a dampener on that line, but as the prices are firm and likely to remain so for the balance of this season, those who do not get their orders in now are likely to have trouble in getting them filled when the season is on and everybody wants their goods at once. Collections are fair.

### Louisville.

**W. B. BELKNAP & Co.**—Business continues quite active; the volume is not disappointing. Prices have done very little to respond to the demand, though here and there is an advance which amounts to something, and figures made in various lines are so firmly held that in so far from being only a negative element of better times they are almost equivalent to an advance in positive expression.

Many articles, especially the staples, are not easy to get for immediate shipment. Orders are booked for immediate shipment and then held as long as the patience of the buyer will permit.

During the quieter times factories have improved the opportunity to increase their facilities for production, and thus cheapen it, as, for example, the Ohio Falls Iron Works here have just added a 10-inch mill.

A neighboring rolling mill explained to us the other day that their output

on a single night turn was as much as it was a short time since for both day and night; so with these extraordinary facilities being multiplied it is no wonder that people are not scared about the supply.

Crops throughout the Southern country promise well, although rains have been superabundant in some quarters.

The banks are well supplied with money, and cannot conceal their satisfaction at the increasing demand for legitimate discounts. This latter is a cheerful sign of growing trade.

### San Francisco.

**MILLER, SLOSS & SCOTT.**—We have been able in our last several reports to advise the gradual increase in the volume of business. This is brought about mainly through the greater number of orders, rather than through an increase in the size of individual orders. This condition still continues.

We have been accustomed to look upon this month and the next as among the best in the year, but on account of the condition of our crops, and small returns on what our farmers have been able to harvest, do not feel warranted in looking for a large increase over past months.

Notwithstanding this condition of affairs we find collections to be fully up to previous years, and notice further a smaller number of failures reported this year than last. This is a ray of light out of the darkness which leads us to hope for better times.

### St. Paul.

**FARWELL, OZMUN, KIRK & Co.**—In our last we referred to the severe drought then prevailing over this section in common with large areas of territory throughout the States, and also to the imminent danger of both forest and prairie fires.

At the exact time that we were penning those lines the most extensive and destructive forest fire that the country has experienced since the great Michigan fire in the early seventies had broken out and had started on its path of death and ruin in the timber country lying between St. Paul and Duluth.

Millions of dollars and probably nearly 500 human lives have thus been lost in Eastern Minnesota and Western Wisconsin, and the destruction in the burned district is appalling.

But charity has hastened to the relief of the stricken people, and they are going to work resolutely to restore, in a measure, their lost homes and fortunes, and life and activity are again coming to the front, though to a large extent in different channels from those of the past.

Some large saw mill plants will not be rebuilt, and some towns will probably lose part of their former prestige, at least, in the early future. Another result, probably, will be that the land will be divided up into small tracts and parceled out to small farmers. The railroads and business communities are much interested in this prospective development, and the outcome may be that in a few years even more



prosperous communities than those that have been thus horribly wiped out may inhabit the burned district. It would not be the first time in the world's economy when a great disaster has permanently changed the employment of a people, and to their future advantages. Lumbering at most can exist only a few years on a large scale.

The effect on business here was not large, being principally sympathetic, but to the people immediately involved it meant not only the loss of property, but also of precious lives.

Some families have been entirely destroyed by this hurricane of fire. Other families have but a member or two left to start out in the battle of life again, with the horrible memories of the disaster to brood over. Others still may have come out with no loss of life, but every dollar they had has been lost and the future to them must look dark indeed. But the contributions of the charitable will help them greatly, and the situation will now steadily improve. Considerable rains have lately fallen, and fear of other serious disasters has been greatly allayed, but much more rain is needed.

Trade has kept up fully to expectations. Stocks have been difficult to keep up ever since the strike. It is now more than two months since the strike closed, and there has been a steady trade from that time. Its continuity has been its most marked feature. The usual dullness of harvest seems to have been anticipated and absorbed during the strike. The State Fair has been in progress this week, and it with the other attractions here, including reduced railroad fares, has brought many customers to St. Paul. It is very pleasant to meet them and exchange greetings and talk over business matters and come to know each other better personally.

The crops are being threshed rapidly and the yield is better generally than expected, both in quantity and quality. Still it is not a large crop and the price of wheat is low.

It is doubtless true that the farmer can buy about as much Hardware, or groceries, or clothing with the price of a bushel of wheat now as he could several years ago, but the trouble is that this rule does not work in paying his debts. The measurement of his debts is in dollars, not in bushels of wheat. An era of low prices like this is a hard time to pay debts. Yet our farmers are gradually reducing their indebtedness and we believe are on the road to permanent prosperity.

#### Portland, Oregon.

CORBETT, FAILING & ROBERTSON.—There is no great change to note, either in trade or collections. The conservative policy still rules with the interior merchants, so far as purchases are concerned, and, as intimated in our last, remittances cannot be large until the wheat money begins to circulate. It is true that a large proportion of the proceeds of the crop will be absorbed in payment for sacks and labor, leaving less than is desirable for the producer's share, yet there will unquestionably be a perceptible lightening of the burdens and a consequent return of confidence, and, generally, a better feeling.

It is not safe, however, to predict a heavy fall trade. People who have learned, as most of our rural population have, in the hard school of adversity will continue to practice the lessons of economy which necessity has forced upon them, and the retail trade will for some time be measured by the immediate wants of the consumers.

Jobbers' stocks are apparently ample for all requirements. The present low

rates and prospect of an early advance have not induced speculative orders, but as a matter of course dealers have, like good merchants, provided for all reasonable expectations of trade.

Two or three days of rain during the first week of September has driven away the dense smoke and done no damage to grain in the field.

#### New Orleans.

A. BALDWIN & CO.—The volume of business is beginning to assume larger proportions, and the number of orders coming in is gradually increasing from day to day.

Continuous rains in some sections have had some slight effect, but not enough to hurt the general improvement noticeable with the movement of the crops. We even look for continued improvement in the next 60 days. The activity in the local building trade is causing an increased output of all goods in the builders' line.

Prices are still low on most products, while there is a slight improvement in the price of iron.

#### Philadelphia.

##### SUPPLEE HARDWARE COMPANY.—

We are glad to be able to report a continued improvement in trade. Orders show depleted stocks in the hands of interior merchants, and in tone of letters received from customers we find a far better feeling exists, and many letters indicate a relief that Congress has adjourned, thus permitting the trade to have a rest from agitation.

It is but natural to compare the trade of the last two weeks with the same two weeks of 1893. For the present one need not go beyond that date. The result is favorable to increased trade in 1894.

There is an increase in the resumption of manufacturing establishments immediately around us and an increase in the output in the iron districts, where depression has been the rule for so many months.

So far as we can learn, a hopeful feeling exists for the fall trade.

#### Baltimore.

CARLIN & FULTON.—Since our last letter there has been very little to report of much interest. Stimulated by good crops, trade from the South continues active, though the fearfully low prices for goods make it hard work to bring the gross sales up to the desired amount in dollars and cents.

While there has been the usual demand for general Hardware, the sale of Guns, Ammunition and Cutlery has shown a most decided improvement, and it is almost impossible to keep stocks up to the requirements of daily orders.

The reports of increased railroad earnings and bank clearings point to a general improvement in business, and we believe that now the tide has turned and we may expect an increase in trade in all directions.

#### Omaha.

LEE-CLARKE-ANDRESEN HARDWARE COMPANY.—While it is impossible to notice any great improvement in the general business conditions of the Omaha jobbing Hardware trade, it is safe to say that trade is holding its own, and the volume is about all that could reasonably be expected. The majority of country merchants complain of a light trade, but they expect to do some business, and are preparing to take care of it as it comes.

One good feature of the situation in the country is the fact that there are no burdensome stocks of goods on the shelves to be carried over to another season. This leaves the country dealers free to buy only what there is a demand for.

There is every indication that this will be a year of small orders, as the general conditions are such that liberal buying cannot be expected for some time to come.

It is gratifying to observe that high prices prevail for all classes of feed stuff, and those sections not afflicted by the late drought may congratulate themselves on having a bonanza as far as their products extend.

## Notes on Prices.

**Wire Nails**—There continues to be a good and increasing demand for Wire Nails, as the trade are evidently sending in their orders somewhat more freely. There is, however, little evidence of a speculative demand, most of the Nails ordered being required to meet the demands of current trade. There is also an increase in the production, as some mills which have been idle have started up again and others have increased their output. The tone of the market is not as strong as might be desired, and there continues to be a good deal of active competition among some of the makers. The market price is \$1 for carload lots at mill, but this figure has been shaded on especially large orders with an attractive average. The New York price is \$1.20 on dock, and \$1.25 to \$1.30 from store.

*Chicago, by Telegraph.*—The situation the past week has been unsatisfactory from the manufacturers' standpoint. Some have been compelled to make concessions in order to hold their trade, but others have stood firm in the belief that matters will speedily right themselves. Something favorable is expected from the meeting held at Pittsburgh Tuesday, which was expected to take action calculated to maintain prices. Quotations on factory shipments are \$1.10 to \$1.15, Chicago. Jobbers are selling small lots from stock at \$1.15 and carloads at \$1.10. They report far better sales the past week than for a long time.

**Cut Nails.**—The Cut Nail market is not in a more satisfactory condition than Wire Nails. The demand is fair, though not especially heavy. In the matter of prices the market is not strong in tone, and there is some unevenness in quotations. Some of the Western mills are competing actively for business in territory more conveniently covered by the Eastern manufacturers, and comparatively low prices are being made for Nails delivered at such points. Quotations remain as before, 90 to 95 cents for carload lots on dock, New York, and from store in small lots, \$1.05 to \$1.10.

*Chicago, by Telegraph.*—The Lake-side Works are again in operation and



den, carpentry work, the manner in which the displays of the different manufacturers and merchants should be exhibited, the cost of space, &c., and similar questions were carefully considered. The feasibility of the project was thus made evident and the association saw their way clear to moving directly in the carrying out of their plan. In connection with the decision to hold the exposition the following form of pledge was adopted for signature:

We, the undersigned, agree to become members of an association the object of which is to hold an exhibition in Madison Square Garden, May 18 to 18, 1895.

To the above the following signatures were secured:

The Schultze Gunpowder Company, Fred. Sauter, Walsrode Smokeless Powder Company, Wm. Lyman, Armin Tenner, Wilkes-Barre Gun Company, Cornwall & Jespersen, Colt's Patent Firearms Mfg. Company, Rolla O. Heikes, Chamberlin Cartridge Company, E. I. DuPont de Nemours & Co., Frank Lawrence, Union Metallic Cartridge Company, Hartley & Graham, Remington Arms Company, Bridgeport Gun Implement Company, W. W. Hart & Co., Tatham Bros., Winchester Repeating Arms Company, Wiebusch & Hilger, Ltd., Union Hardware Company, Standard Keystone Target Company, American E. C. Powder Company, Brooklyn Knitting Company, A. G. Spalding & Bros., Geo. Barnard Company, Schoverling, Daly & Gales, Forehand Arms Company, Narragansett Machine Company, F. S. Webster, John T. Bailey, W. G. Paddock, Stewart & Stau, Von Lengerke & Detmold, J. H. Studer.

The following officers were then chosen:

*President*, CHARLES TATHAM.

*Vice - Presidents*: CHARLES DALY, WILLIAM J. BRUFF, J. WALTER SPALDING, JOHN H. HALL, A. W. HOOPER, CHAS. IMBRIE, SOLOMON TURK, G. B. GRINNELL, WILLIAM HART, CHAS. WIEBUSCH, T. W. BRYANT, DR. N. ROWE, A. C. GOULD, L. C. BRUCE, A. W. MONEY, J. H. STUDER, CHAS. W. MOWRY, J. SEAVER PAGE, WM. LYMAN, EUGENE DUPONT.

*Secretary*, F. S. WEBSTER.

*Treasurer*, J. A. H. DRESSEL.

*Executive Committee*: CHARLES TATHAM, CHARLES DALY, J. VON Lengerke, F. S. WEBSTER, J. H. STUDER, T. W. FRANKLIN, J. WALTER SPALDING, J. A. H. DRESSEL, P. G. SANFORD.

Inaugurated under such auspices the success of the project would appear to be assured. The houses concerned in the matter are thoroughly representative, many of them occupying prominent positions in the trade. If the proposed exhibition is made as attractive as its character permits it will undoubtedly be very popular, and will awaken a great deal of interest on the part of the public and the trade. It will be a rare opportunity to display a

large variety of goods and appliances in which not only sportsmen but the public at large are interested, and the result should be an exhibition of exceptional attractiveness, which should be advantageous not only to the houses directly concerned in it, but also to the Hardware trade, who are giving increased attention to these lines.

### Manufacturers' Association of Kings and Queens Counties.

THE Manufacturers' Association of Kings and Queens Counties, New York, held their first regular monthly business meeting since the adjournment in May through the summer months at their rooms in the Pouch Mansion, 345 Clinton avenue, Brooklyn, Monday evening, September 17. Many reports were submitted and approved, on which the various standing and special committees had been hard at work during the summer.

A communication was received from the New York Board of Trade and Transportation asking support and uniformity of action looking to a material reduction of the present extortionate telephone charges. This was accompanied by a statement giving the history and present status of the case. The secretary of the Manufacturers' Association announced that communication had been effected with trade organizations relating to this subject in every county of the State, with a view to solidifying and concentrating effort to secure remedial legislation at the next session of the Legislature.

W. H. Nichols for the Board of Directors reported in favor of adopting Cushing's Manual for the government of the association hereafter; he also submitted a code of rules of order and order of business, which was unanimously agreed to. He then gave notice of an amendment to be offered November 19, amending the by-laws changing the regular monthly meeting from the third Monday to the second Monday of each month, from September to May, inclusive, and making the annual meeting to occur on the third Monday in April. Fourteen new names for membership were reported by the Committee on Admissions, and duly elected as members of the association.

The Committee on Commerce and Transportation reported fully on the question of discrimination in freight rates in favor of the European manufacturer as against the manufacturer here. The complaint is made that foreign steamship lines have a pro rating arrangement with American transportation companies, by which each accepts a very largely reduced compensation as carriers, which, it is positively stated, amounts in some cases to a lower figure from Europe to important interior points than is granted by the same railroads from the Atlantic Coast to Western cities. This makes it possible to freight large blocks of merchandise from abroad in competition with domestic production at a less figure than is granted the

Eastern manufacturer, which if not stopped will eventually lose the producer here his market. It was, after considerable debate, found to be the sense of the meeting to thoroughly prepare a strong case, with a view to retaining eminent counsel to litigate it. It was referred back to the appropriate committee for further consideration.

In connection with the effort to secure for Brooklyn express rates virtually identical with New York to all points in America, the Committee on Express Facilities stated that advices had been received from Adams, American and other leading companies saying no reduction in rates from Brooklyn could be made. The matter was referred back to the committee for further action.

The Committee on Information reported the receipt of a number of catalogues to be filed for reference, and the statement was made that steps were being taken toward accumulating a library of technical information suitable for the wants of members.

Mr. Covington, for the Insurance Committee, in an instructive address, which showed great familiarity with the subject, exhibited a number of charts, on each of which was a circle about 8 inches in diameter, divided into sectors variously colored and proportioned, showing the percentage both in area of the circle and figures of the causes relating to the origin of fires, each chart being arranged with regard to each particular business, the data being compiled from underwriters' statistics. The object of the charts is to hang them around mills, factories, shops, &c., for the information of employees, who are required to govern themselves accordingly.

The association now has a total membership of 243 and nearly \$5000 balance to its credit.

### Saturday Half Holidays.

THE WHOLESALE Hardware houses of Chicago, which have been closing at one o'clock on Saturday during the summer, have now resumed their usual practice of closing at five o'clock. The abandonment of the Saturday half holiday is regretted exceedingly by the employees, who had hoped that the summer custom might develop into a perpetual institution. The Saturday half holiday in the summer is a matter of comparatively recent establishment in Chicago, and when it was first broached the idea of giving up an entire week day afternoon was not regarded with much favor by those business men who had been trained in the school of early and late hours and all hours possible for the accommodation of customers. But the practice once begun, and participated in by all, it was seen that closing on Saturday afternoon made no material difference in the transaction of business. Customers soon learned that stores were closed at one o'clock on Saturday and governed themselves accordingly. They would do the same thing for the remainder of the year if such a regulation should be permanently established. The wholesale stove houses could also adopt the same cus-

tom if managers were willing to try it. There is no doubt that employees would work harder during the week to so dispatch business that the Saturday half holiday could easily be granted. The same remarks apply to other jobbing centers than Chicago. In fact, there is no reason why a Saturday half holiday should not be a general institution in the wholesale Hardware and stove trades throughout the country. The volume of business done would be no less, and both employers and employees would be the gainers by the few more hours allowed for recreation.

## Neatness and Light.

### Hints for Hardwaremen.

BY AN EXPERT.

**NINETY PER CENT.** of the failures in advertising have been because the advertiser expected his advertisements to do the selling.

The appearance of a store has as much to do with successful business as has the advertising, the goods or the clerks.

A fly specked electrical battery will ring just as many bells, but it won't sell well.

Rusty tools won't sell for half their value.

A little elbow grease will make a stove worth 25 per cent. more.

The appearance of anything to be sold has as much to do with the sale as the actual intrinsic value of the article itself.

It is just as essential, so far as selling is concerned, to have the package clean as to have the goods inside clean.

Light and cleanliness are the two great essentials to selling.

A dark store is never as profitable as a light one.

If the retailer is so unfortunate that he cannot light his store naturally let him light it artificially.

Keep the store light all the time, in dull times and in good.

Folks think they see unseen dirt in a half lighted store.

I have yet to find a first-class, progressive and profitable business run without plenty of natural or artificial illumination.

Do not try to convince the public that your business is so solid that you can do as you please.

There never was a man free to do as he pleased. You have got to do as others want you to do, or do no business.

A dirty, ragged clerk can sell goods, but a well dressed clerk, who isn't a dude, can sell more.

A poor but well brushed suit of clothes, with a clean collar and a pair of polished shoes on a clerk have almost as much to do with the selling quality of that clerk as has the ability of the clerk.

Do not make the mistake that some storekeepers do, of having the front of the store light, bright, clean and attractive, and the back of the store like the inside of a cave.

Dusters and brooms don't wear out very rapidly.

Some folks believe that in economy is the success of business, that what you save is as important as what you earn—and they are right. But the successful business man, in not forgetting to save, figures that what he makes has as much to do with his success as what he saves.

It is better to put out \$1000 and take in \$2000 than put out \$500 and take in \$1000.

Everybody knows that profit is the difference between expenditure and receipt, and yet fully one-half of the business men make more effort to cut down expenses than to increase business.

## Sherman & Lyon Co.

**THE TRADE** have learned with regret of the financial embarrassment of the Sherman & Lyon Company, 100 Chambers street, New York. Owing to the severe panic in Australia and the financial stringency which has prevailed there for the past two years the work of the company was very much hindered and their resources overtaxed to such an extent that the treasurer thought it was for the best interests of all concerned to make application for a receiver. This was accordingly done on August 13. No definite announcement has as yet been made of the Company's affairs. Both Mr. Sherman and Mr. Lyon are widely known to the trade and much sympathy is expressed in view of the difficulties which have overtaken their enterprise.

## Raw Hide Belting.

**J. R. MACDONALD**, Painesville, Ohio, issues a pamphlet, explaining the features of "The Coming Belt," a raw hide Belt manufactured by him. It is remarked that a raw hide Belt is always selected when the strain is unusually severe, and that its extreme tenacity permits of its being run much looser than any other belt, thereby enabling it to do its work with much less strain on the shafting, bearings, pulleys and lacing. Also that being nearer nature than any other Belt, it furnishes its own lubricant, thereby not only remaining soft, but becoming softer and more adhesive with use. The objectionable features of tanned and half tanned Belt are enlarged upon in the pamphlet, and comparisons made with raw hide Belt as to their lasting qualities. "The Coming Belt," it is stated, is guaranteed when properly cared for, that it does not need oil of any kind, but that a little clean lard tallow applied to the grain will not injure it.

## The Samuel Winslow Skate Mfg. Company Catalogue.

**THE SAMUEL WINSLOW SKATE MFG. COMPANY**, Worcester, Mass., have issued an attractive catalogue of Ice Skates for 1894. The book is bound in paper, on the front cover of which is a skating scene handsomely lithographed in colors. A view of the company's extensive factory is given on the inside of the back cover. The line of goods include the National Club all clamp Skates, in ten styles and finishes, speed Skates, Winslow's Skates, National Club in half clamp and wood bottom strapped

Skates. A new cipher telegraph code is given for 1894, all codes of past years having been discarded. The company also manufacture Roller Skates, to which a separate catalogue is devoted.

## Requests for Price-Lists, Circulars, &c.

**C. D. MOORE** has resigned his position as secretary of the Westfield Heating & Plumbing Company, Westfield, Mass., and formed a partnership with A. N. Sprague, who has been connected for many years with H. O. Sprague & Sons. The new firm will be known as Sprague & Moore, and will carry a large line of Hardware, Paints, Oils, &c. They will also do heating, plumbing and general jobbing. They have leased the old quarters of G. B. Gaylor, 49 Elm street, Westfield, and expect to be ready for business by the first of October. The new firm will be pleased to receive catalogues and quotations from the trade in general.

Osborn Hardware & Tool Company, 414 Market street, San Francisco, Cal., are anxious to secure a full line of catalogues, and will be glad to receive the latest lists from manufacturers and dealers in Hardware who have not already favored them with printed matter, with advices also in regard to trade discounts. Where it is convenient they suggest that they would like to have the catalogues in duplicate.

## Gunoleum.

**THE CHARLES WILLY MFG. COMPANY**, Bay Shore, L. I., are offering Burr's Gunoleum, a lubricant for protecting and preserving metals from rust and tarnish. It is recommended by the manufacturers for use on guns, rifles, revolvers, cutlery, bright steel goods, typewriters, fine machinery, dog chains and collars, metal trimmings on fishing rods, bicycles, stove pipe, carpenters' tools, skates, brass plates, brass railing, brass work on yachts, &c. The preparation is about the consistency of vaseline, and it is stated that heat or cold does not effect its consistency, and that it never gums or drips. The manufacturers state that the preparation prevents pits in shot gun and rifle barrels, and that a light coat of it on any unprotected metallic surface will prevent rust, corrosion or tarnish and will preserve its finish.

The Gunoleum is put up in collapsible tubes of two sizes, also in  $\frac{1}{4}$ ,  $\frac{1}{2}$ , 1 and 5 pound cans. Samples will be sent free by the manufacturers upon application.

**R. D. BOICE**, a former Hardware merchant of Geneseo, Ill., is in the East and has been calling upon his friends in the trade in New York, Philadelphia and other points. Mr. Boice retired from the Hardware business some months since, after 50 years' connection with that line, the last 35 years of which have been spent in Geneseo. Prior to that period Mr. Boice had been identified with the trade in Pittsburgh, Pa., Ashland, Ohio, and Rochester, Minn. While Mr. Boice is giving his attention to banking and other enterprises he retains a lively interest in Hardware matters, and takes pleasure in the friendships formed during his half century of identification with the trade.



## McKinney Mfg. Company's Catalogue.

**McKINNEY MFG. COMPANY,** Allegheny, Pa., have issued an attractively printed and well arranged illustrated price-list of 64 pages, devoted to Butts, Strap and T Hinges, Trunk Hinges, Felloes Plates, Washers and special goods in wrought steel. A view of their works is followed by an alphabetically arranged index. The company remark that they have added largely to their buildings and machinery; and that they now have the largest works in this country for the exclusive manufacture of Steel Hinges and Butts. A feature of the catalogue is the *fac-similes* of labels printed in colors, and placed immediately above the list prices of the Butts to which they belong. The figures denoting the size of the Butts are most prominent on the labels, while each class of Butt has a label of a distinctive color. Thus the labels for Bronze Butts are printed in bronze on a black background; these for Japanned Butts are printed in black on white paper, and the labels for the various sizes and kinds of polished Steel Butts are printed in black on different colored papers. All labels except those for bronzed goods have three blank spaces to the right for marking cost and selling price. The *fac-similes* of labels have been added as a help to the trade, which will enable them to become so acquainted with the different classes of Butts, that they can be readily distinguished at a glance. The list prices give the size of the Butts open, price per dozen pairs, size of screws, the number of screws to each Butt, and the number of dozen Butts in full cases. The paper used, the engravings and the typographical arrangement of the catalogue are excellent. The manufacturers state that their aim in getting up this price-list has been to give the trade a catalogue that is not only a neat book, but a price-list which is convenient for reference, and of a size not too cumbersome for frequent use.

## Trade Items.

**IN ONE OF THE SPECIAL NOTICES** this week announcement is made by a gentleman well known in the trade that he will open an office in Chicago October 1, and that he is desirous of obtaining agency of manufacturers of Hardware Specialties or regular Hardware. The advertiser is to be addressed "Chicago Agencies," care of the office of *The Iron Age*. This opportunity is deserving of the attention of those desiring to make such an arrangement.

**WILLIAM ROGERS MFG. COMPANY,** Hartford, Conn., are offering a new pattern in flatware called the Ormonde. This pattern will be made in the regular line of Spoons, Forks and Fancy Pieces. The design is on solid silver lines and characterized by simplicity and richness. A Spoon of this style is shown in their advertisement on another page. William Rogers Mfg. Company's factory is now running full handed on full time and they report a good supply of orders ahead.

**O. L. MILLARD** of Millard Bros., ironmongers, London, has just returned to England after a two weeks' visit to America. An arrangement has been effected, we are advised, with Wm. E. Peck & Co., export merchants, 64 William street, New York, to do their general purchasing in this country.

**SOUTH HARRISBURG CHAIN WORKS,** Harrisburg, Pa., advise us that the reports that their factory has been burned down are unfounded. The

Agricultural Implement factory of Smith & Tate adjoining their plant was destroyed, but without harming their works in the least. The South Harrisburg Chain Works report that they are working full force and full time.

**HEIMBUECHER & WEBBER,** St. Louis, Mo., have been appointed agents for the Western and Southern States for the Rotary Curling Iron, made by the Rotary Curling Iron Company, Ottumwa, Iowa. They report heavy sales of this article, and, notwithstanding the large capacity of the factory, are pushed to keep abreast with their orders.

**DAVID H. SMITH,** warehouse 6 New Reade street, near Centre, New York, deals in Cold Rolled Shafting, Machinery and Sheet Steel, Drill Rods, &c. He was formerly in Burling slip. A feature of his business is that he cuts Steel to length from stock for tool and die makers or any who require this material, obviating the necessity for buying whole lengths when but a part, no matter how little, is needed.

**HENDRICKS & CLASS,** 256-257 Broadway, New York, manufacturers and manufacturers' agents for domestic and export trade, are representing the following concerns for both export and domestic business: Akron Tool Company, Central City Bolt Company, J. A. Dubuar Mfg. Company, Findlay Rolling Mill Company and West End Rolling Mill Company. For export only, Cobb & Drew, Hard Mfr. Company and Amsterdam Broom Company. This list embraces, it will be seen, manufacturers of Heavy Hardware and Ship Chandlery, Railway and Dock Builders' Supplies, Gray and Malleable Iron and Steel Castings, Brooms and Brushes, Wheelbarrows, Bolts, Nuts, Rivets, Tacks, &c.

## It Is Reported—

### Alabama.

That the TROY Hardware firm of J. B. Wiley & Co. have been dissolved, W. S. Coleman withdrawing from the firm and selling out his interest to J. B. Wiley.

### Arkansas.

That J. M. Smith, Stoves and Hardware, BROOKLAND, has been succeeded by Smith & Barber.

That E. P. Zackery, Stoves and Hardware, LACEY, has sold out to Sherwood Baker, who will continue the business.

That A. O. Young, dealer in Hardware and stoves, NEBO, has sold out to Young & Webb.

That M. E. Coffin & Co. have succeeded G. L. Coffin in the Hardware and Stove business at SWIFTON.

That the partnership under the style of Moore Bros. & Co., Hardware and Stoves, HOT SPRINGS, has been dissolved. Moore Bros. are successors.

### California.

That J. S. Jack's Hardware store, at ANGEL'S CAMP, has been burned out.

### Colorado.

That the Dewey Hardware Company, DENVER, have been incorporated, with a capital stock of \$7000.

### Florida.

That on October 1 Steenburg & Thomas of GAINESVILLE will transfer their Heavy Hardware business to E. Baird & Co., and in the future they will confine themselves to retail city trade. W. B. Taylor, who has for some years been buyer for Steenburg & Thomas, has been engaged by E. Baird & Co. in the same capacity.

### Georgia.

That Thomas Berry has sold out his interest in the Terhune-Berry Hardware Company, ROME, to George and

Pennington Nixon, formerly with Rome Hardware Company.

That A. B. Handley & Co., dealers in Hardware, LA GRANGE, have dissolved, J. E. Jones retiring. G. E. Hansom will continue the business.

### Illinois.

That William McNeill, Hardware merchant, of PROPHETSTOWN, has commenced the erection of a two-story brick building on the site of his former warehouse, and when completed will occupy the building with his stock. The building will be finished, it is thought, about December 1.

That Reed & Heine have bought the Yurs & Holland Hardware stock, at ELGIN.

That a new Hardware store will soon be opened in SMITHSHIRE by Mr. Bird-sall.

That after 28 years of continuous business in MALTA, G. W. Smiley has sold his Hardware and Agricultural Implement business to his son, R. B. Smiley. The former will retire from active business.

That Frank and Thomas Shannon purchased the C. E. Olmstead stock of Hardware, at MILLEDGEVILLE, and took possession on September 1.

That Reynolds & Hartley have sold their Hardware business, at GENESEO, to J. P. Cowan of Western NEBRASKA, who will be assisted in managing the business by W. O. Misner from the same section.

That the Hardware firm of Bigler & Danahy of AURORA have dissolved, Mr. Danahy having purchased his partner's interest in the business. Mr. Bigler will continue in charge of the business for the present as heretofore.

That the business portion of MALTA was swept by fire on the morning of the 8th inst. Among other business establishments destroyed was the Hardware store of C. W. Haish. The fire originated in Mr. Haish's store, which had been struck by lightning.

That D. B. Keigheir of KEMPTON has bought the stock of Hardware, lumber, &c., of I. A. Goodman in CABERY.

That W. P. Handel's Hardware store, at ROBERTS, has been destroyed by fire.

### Indiana.

That L. M. Fishbaugh has purchased a half interest in Wm. Cover's Hardware business, at MARKLE.

That Willis P. Maine, dealer in Hardware, INDIANAPOLIS, has sold out.

### Iowa.

That burglars entered the Hardware store of A. O. Rudolph on the 28th ult., and carried off a large quantity of Knives, Razors and Revolvers. About \$250 worth of goods were secured. There is no clue to the thieves.

That V. S. Bomboy of the firm of Bomboy & Alcorn, BANCROFT, has sold his interest in the Hardware business to W. W. Alcorn, who will continue at the old stand.

That J. B. Hathaway & Co., in the Hardware business at ALPHEA, have been succeeded by Davis Bros.

That a new Hardware store is being established at SIOUX VALLEY by Mr. Frerichs of ALVORD.

That Stewart Bros., KEOTA, are removing their Hardware stock to their new brick building.

That the Hardware firm of Gortner & Burt, LAKE CITY, have been dissolved by mutual consent, J. H. Gortner retiring and K. R. Burt, by reason of purchase, assuming entire control of the business.

That Joseph Gross is preparing to start a new Hardware store at CRESTON.

That the Hardware store of Frysliie & Langley, DOWS, was recently destroyed by fire. Loss, \$3500; insurance, \$1200. J. L. Duel & Co.'s store was also consumed. Their loss is estimated at \$4000, with insurance of \$3000.

That W. F. Wilson has purchased the Hardware business of Myers & Robinson, at REINBECK.

#### Kansas.

That Grant Tucker will shortly open a Stove and Tinware store on the corner of Eighth and Kansas avenues, ATCHISON.

That A. Bolks has succeeded A. Bolks & Son in the Hardware business at GAYLORD.

That Harvey Kincaid has sold out his business at GIRARD.

#### Kentucky.

That Myers & Owens, Hardware dealers, CARLISLE, have dissolved. John W. Myers will continue the business.

#### Louisiana.

That Woolman & Kirkwood, Hardware dealers, LAKE CHARLES, have sold out to Mr. Beardsley.

#### Massachusetts.

That C. D. Moore has resigned his position as secretary of the Westfield Heating & Plumbing Company, WESTFIELD, and formed a partnership with A. N. Sprague, who has been connected for many years with H. O. Sprague & Sons. The new firm will be known as Sprague & Moore, and will carry a large line of Hardware, Paints, Oils, &c. They will also do heating, plumbing and general jobbing. They have leased the old stand of G. B. Gaylor, 49 Elm street, WESTFIELD, and expect to be ready for business by October 1.

That the Crosby Hardware Company have been recently organized at HOLYOKE.

That James E. Potter, in the Hardware business at MEDFORD, has sold out to D. O. Morton.

That a new Hardware firm is that of E. C. Gardner & Co. of NEWTONVILLE.

#### Michigan.

That W. C. Congdon's Hardware store, at CEDAR SPRINGS, was burglarized on the 5th inst. About \$35 worth of goods were taken. This makes the sixth or seventh time that the store has been robbed within a comparatively short period.

That A. J. Rankin has purchased the Hardware stock and store of E. B. Gaylord, at SHELBY, and will continue the business at the old stand.

#### Minnesota.

That J. B. Rahskoff of BELLINGHAM contemplates entering the Hardware and lumber business at FLORENCE.

That How Bros. have sold their Hardware store at FERGUS FALLS to Lee & Peterson.

That Ole K. Nyhus, who has for several years been identified with the firm of Nyhus & Lund, VINING, has started a new Hardware store in that place under the style of Ole K. Nyhus & Co.

That L. Blakestad & Co. of LYLE will open a new Hardware store at BLOOMING PRAIRIE on September 20.

That Keegan & Kanne, WATERVILLE, have dissolved partnership.

#### Missouri.

That the W. J. Flynn Hardware Company of St. JOSEPH have sold their business to Whitfield Bros. of RUSH HILL, who will continue it at the former stand.

That J. H. Conley, in the Hardware business at MIRABILE, has sold out.

That Williams & Benedict of EXETER, have broken ground for a new Hardware store, 22 x 60 feet. Their former establishment was destroyed by fire a short time since.

#### Nebraska.

That W. H. Garmire of KANSAS has bought the Hardware business of W. E. Morley, at COOK.

#### New Mexico.

That the Rose Hardware Company, ALBUQUERQUE, have been incorporated by F. N. Rose and others. The capital stock is \$50,000.

#### New York.

That Arthur H. Phillips, Hardware merchant, FISHKILL LANDING, has sold out.

#### North Dakota.

That W. K. Straub, Hardware merchant, COGSWELL, has been succeeded by S. T. Peters & Co.

#### Ohio.

That W. H. Waugh's Hardware store, at WEST LIBERTY, was burglarized of \$400 worth of goods on the 10th inst.

That W. H. Jackson & Son, dealers in Hardware, Stoves, &c., CLYDE, have sold out.

That E. C. Grossenbacher's Hardware business, at TOLEDO, is now conducted under the style of E. C. Grossenbacher & Co.

That Ketel, Katschke & Co., TOLEDO, have sold out to the Ketel Hardware Company.

#### Oklahoma.

That John T. Stewart of WELLINGTON, KAN., has purchased the Frantz Bros.' Hardware stock, at ENID.

#### Pennsylvania.

That Schneider Bros., Hardware merchants, of SCRANTON, are erecting a one-story addition to their establishment.

That Riley, Bressler & Son, Hardware merchants, of LYKENS, have been dissolved.

#### South Dakota.

That W. C. Holmes of GARY has purchased the Hardware stock of C. Dillon of SIOUX FALLS, and will continue the business at the old stand.

That the Braham Hardware stock, at ARTESIAN, has been purchased by H. V. Low of BROOKINGS COUNTY.

That C. G. Culver has sold his interest in the Hardware business of Culver & Smith, HURON, to his partner, David Smith. Mr. Culver will travel Eastward.

#### Tennessee.

That Shannon & Dudley, Hardware, Stoves, &c., GREENFIELD, have been succeeded by Coates Bros.

That the Bristol Hardware Company of BRISTOL were recently bought out by J. M. Barker, who will organize a new company to do an exclusively jobbing business.

That James A. Boyd & Co., JONESBORO, have dissolved. Mr. Boyd will continue the business.

#### Texas.

That the Hardware store of Banner Bros., WORTHAM, was broken into by thieves on the 7th inst.

That the building occupied by the wholesale and retail firm of Pollard & Creager, DENISON, was gutted by fire on the 8th inst. The stock of Hardware was also partially destroyed, and the loss will foot up nearly \$12,000, part of which is covered by insurance. The origin of the fire is unknown. Most of the damage suffered was from water.

That J. C. Hillsman & Sons, Hardware, &c., CARMINE, have sold out.

That A. Anderson, Hardware merchant, CLAUDE, has removed to CLARENDON.

That Holcomb & Williams, LULING, have been dissolved.

#### Washington.

That C. W. Worthen, LYNDEN, has been succeeded in the Hardware business by W. I. Baker.

#### Wisconsin.

That Hounsell & Bowers of POTOMI have sold their stock of Hardware and Harness to Henry Elskamp of DENVER, Col. Mr. Hounsell has started a harness shop in CUBA CITY.

That the Lowell Hardware Company of JANESVILLE have purchased the Hardware Stock of Sherman Bros. of MILWAUKEE and will remove it to JANESVILLE.

That Fred. Bishoff of SUPERIOR will

remove his Hardware business to a new building 24 x 120 feet as soon as the latter is completed. The building will be of wood, one story high.

*The Hardware trade throughout the country are requested to report business changes, improvements and other matters of trade interest suitable for mention in this department.*

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## Price-Lists, Circulars, &c.

**LUDLOW-SAYLOR WIRE COMPANY,** St. Louis, Mo.: Wire Cloth, Sand, Coal and Ore Screens, Riddles and Coal Screen Webs. A catalogue devoted to this line of goods gives illustrations and prices of the various styles and sizes.

**THE ROGERS & HAMILTON COMPANY,** Waterbury, Conn.: Silver Plated Flat Ware. The third edition of the company's pocket price-list illustrates an extensive line of Silver Plated Flat Ware. The book is indexed so that any pattern desired may be referred to instantly. The manufacturers remark that their goods will be kept at the present high standard and improvements adopted wherever possible. Among new goods are mentioned the Majestic Child's Set, also the King pattern, in which a full line of goods are made.

**ROMER & Co.,** Newark, N. J.: Key Blanks. A catalogue devoted to these goods illustrates with list prices Key Blanks for bronze padlocks, steel jail locks, night latches, door locks, cabinets, cupboards, trunks, &c. Attention is also called to the company's line of Unpickable Jail Locks, Night Latches, Padlocks, Railroad Switch Car Locks, Meter Protection Locks, Prison Cell Door Locks, Safe Deposit Vault Locks, Bicycle Chain Locks, Slot Machine Locks, Door Locks and Builders' Hardware.

**BRADLEY & HUBBARD MFG. COMPANY,** New York, Boston, Chicago, Philadelphia, with factories and offices at Meriden, Conn.: Lamps, &c. Catalogues for 1894-'95 are devoted to different lines of goods, No. 81 including Brass Library Lamps, Hall Lamps, Pendants and B. & H. Founts, while Catalogue No. 82 illustrates Banquet, Piano, Table and Boudoir Lamps. A smaller catalogue illustrates a few designs of their different lines, which besides Lamps include Art Metal goods, Bells, Clocks, Fire Place Furniture, Gas and Electric Light Fixtures, Oil Fixtures, Stationary Goods, &c.

**SIMMONS HARDWARE COMPANY,** St. Louis, Mo.: Mail Order Catalogue No. 230. The book is of large size, containing 144 pages filled with illustrations and list prices. The company remark that the catalogue is issued especially for the convenience of their customers who order by mail, and that condensed in the book will be found most of the goods that they carry that are salable for the fall and holiday trade. It is the belief of the company that a house should show their appreciation in a substantial manner of the preference expressed by a mail order by giving such orders the very best attention in every department.

## Paints and Colors.

*It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.*

**White Lead.**—The market remains in very uncertain shape, with outward signs of weak undertone. The weakness is attributed to various causes, including low cost of crude material here, sharp competition between combination and outside brands, and no little effort to work up business in foreign makes, some of which are openly offered as cheaply as recognized standard American brands may be sold. The competition naturally tends to restrict purchases by usually large buyers, since they seem to have more

to gain than to lose by holding off. The smaller trade are moderate buyers also, but market conditions have less effect there than the simple fact that consumption has been comparatively moderate thus far this month. As compared with those that ruled a week ago, prices show very little change.

**Red Lead.**—Prices are very uncertain, but the market is unmistakably weak in tone. Cash buyers of round lots of domestic would doubtless be accommodated at 5¢, although no lists have been issued quoting on that level. Foreign brands are quite as cheap, although, as usual on a disturbed market, some effort is made to create a contrary opinion. There has been merely a routine business during the week.

**Litharge.**—Low grades used in the glass and rubber trades have met with quite good sale, chiefly at about 4¼¢ @ 4½¢, but the higher grades are still in limited demand, and prices for the same are more or less uneven at from 6¾¢ upward, according to quantity and grade.

**Orange Mineral.**—No change of importance in prices has taken place during the past week, but the market shows rather better tone. American producers have now a good amount of orders in hand and importers are less urgent in their offerings of French and German brands.

**Zincs.**—Few orders are being placed for American Oxide, as buyers consider present prices comparatively high. Sellers, however, make little concession, if any. Foreign brands have undergone no change here, although somewhat higher in the primary markets. Business in foreign is fair.

**Colors, &c.**—A livelier business has been done in bulk dry Colors used by grinders, but no important changes in prices have taken place. Other varieties have met with fair sale, chiefly at former prices. Oil Colors and ready mixed Paints are without particular change in price and find quite steady sale.

## Oils and Turpentine.

**Linseed Oil.**—A sharp rise in the cost of raw material has operated to stiffen the market considerably in tone. City crushers have made no change in their quotations, nor have Western concerns, with whom they work together; but the outside firms that latterly competed most keenly and cut prices deepest have withdrawn late extreme lowest quotations. It is doubtful if any brand can be secured now at less than 50¢ on the spot.

**Cotton Seed Oils.**—Dealings have been on a somewhat larger scale and prices have advanced to the extent of about 1¢ per gallon. Unfavorable seed prospects have governed operations to some extent, but actual needs of compound lard and soap makers have had greater influence. The demand is still fairly active and the market quite firm in tone.

**Lard Oil.**—Prices have held very firm. Little if any prime Oil could be secured at less than 68¢, and some pressers have raised their figures to 70¢ for ordinary jobbing quantities. Buyers are extremely cautious at those prices and the business passing is of moderate volume.

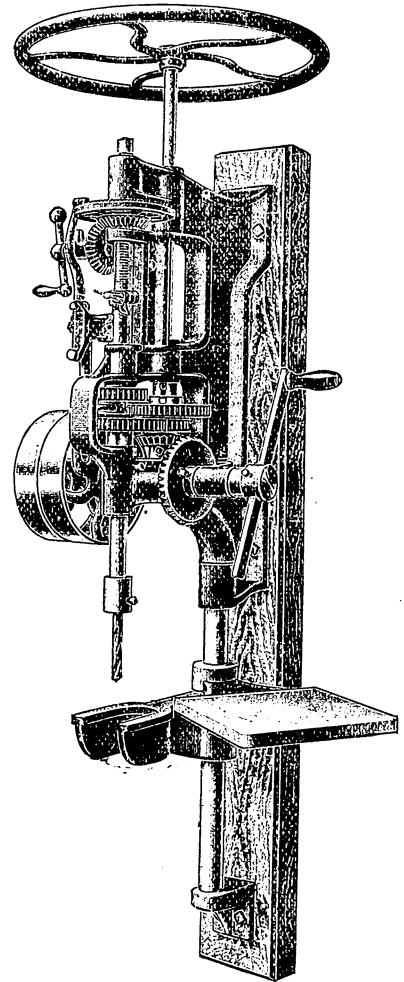
**Fish Oils.**—A considerable amount of business in crude Sperm Oil has been effected in New Bedford at somewhat lower prices. Upward of 1500 barrels went at 57¢. Crude Whale Oil remains quiet and unchanged. In Menhaden only a moderate business has been done. The pressed and bleached Oils are without change in price and sell fairly in ordinary jobbing quantities.

**Spirits Turpentine.**—There is more or less speculative movement in the South and a great deal of uncertainty as to true market value, since the speculation is on secret trust lines. In the New York market there has been only a fair business and prices are now at about 28½¢ for regular and 29¢ for machine barrels.

## The Goddard Blacksmiths' Upright Drill.

All of the blacksmiths' upright drills made by Asa Goddard of Worcester, Mass., are provided with an automatic self releasing quick return, which operates as follows:

The feed screw, which is made very large, with a deep thread, giving a greatly increased wearing surface in the



The Goddard Blacksmiths' Upright Drill.

feed nut, also has a small hole drilled its entire length through which an extension from the spindle passes upward and projects through the top sufficiently for a small spiral spring and compression collar to be attached. This spring, being compressed sufficiently to overcome the slight friction of the feed screw in the feed nut, compels the feed screw to turn with the spindle and run up or down with it whichever way the machine is turned. The thread on the feed screw being left hand, it runs upward when the machine is turned forward.

On the lower end of the feed screw is placed a clamping collar with a projection engaging in a slot in the frame of the drill. When the clamping screw in this collar is tight the feed

screw is prevented from turning with the spindle and is actuated by the feed nut and automatic feed device, as in all drill presses of this type.

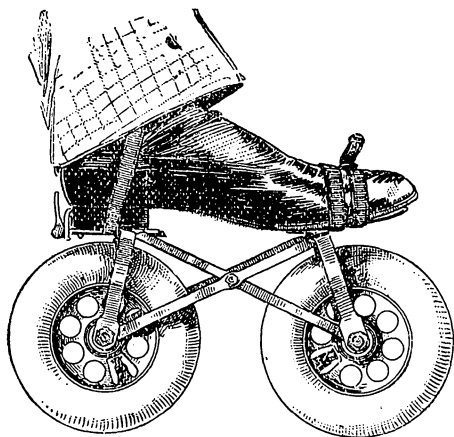
When the drill spindle has been forced downward to the extreme limit, a trip finger attached to the clamping screw in the collar comes in contact with a projection on the frame of the drill and releases the clamping collar, permitting the feed screw to revolve with the spindle and return to its starting point in a few revolutions.

The clamping screw in the collar can be operated by the left hand, releasing or engaging the feed at will, thereby giving the operator complete control of the machine without stopping it or taking his hand from the crank.

The drill here illustrated is designed for the heaviest city truck work and for the machine shop. It has cut gears, which may be quickly changed to run the drill fast or slow. The balance wheel is placed on the top on a separate shaft and independent of the spindle. The feed is automatic, with four changes, and is operated from the spindle, thus insuring a uniform feed whether geared to run fast or slow. This machine will drill from  $\frac{1}{8}$  to  $1\frac{1}{2}$ -inch hole to the center of a 22-inch circle. The greatest distance from the spindle to the table is 22 inches. The drill weighs 350 pounds.

#### The Skacycle.

The Skacycle Mfg. Company, 3103-3105 Ludlow street, Philadelphia, Pa., are introducing a roller skate with a



The Skacycle.

pneumatic tire, as here shown. The skacycle, it is stated, is an American invention, patented some years ago, but not useful until now on account of the failure to secure pneumatic tires that would be servicable. It is designed for use on ordinary roads, an exercise, it is stated, that brings into use every muscle of the legs, back, neck and arms; also, that any one familiar with the use of ordinary roller skates can put them on and with little practice can skate on the road at the rate of 6 or 7 miles an hour. The point is made that the skates are less expensive and more convenient than the bicycle, and that the use of them is more easily learned. The manufacturers claim that the skates are made throughout of the best material, with pneumatic tires of the highest grade; that the wheels run and are adjusted on ball bearings and that every part is perfect. The skates are finished in nickel and retail for \$25 per pair.

#### A Trick Knife.

C. J. Healy, 121 Chambers street, New York, is offering a trick knife, as herewith shown. It is a one-bladed, brass lined, genuine stag handled knife. The knife requires a different method of handling to open and close it from

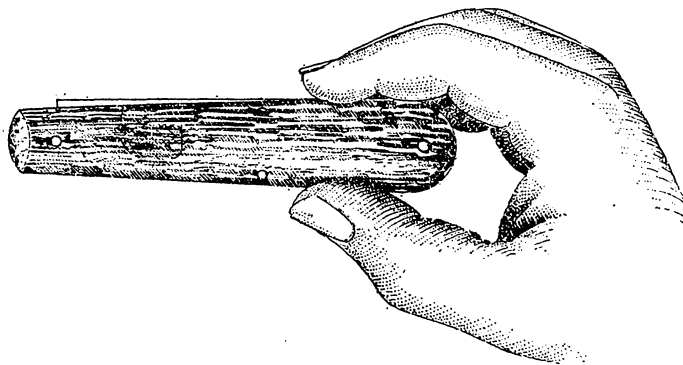


Fig. 1.—Opening the Knife.

an ordinary knife, and herein consists the trick. In the shoulder of the blade is a hole into which a lug drops when the knife is held in a certain position, and from which it drops out when the position is reversed. To open the knife it is held as in Fig. 1, with the shield down and with the forefinger pressing

#### The Handy Floor Jack.

The Racine Malleable & Wrought Iron Company, Racine, Wis., are offering a floor jack, as herewith shown. In use the jack is set against the board with the handle turned down, the operator's foot placed on the foot block,

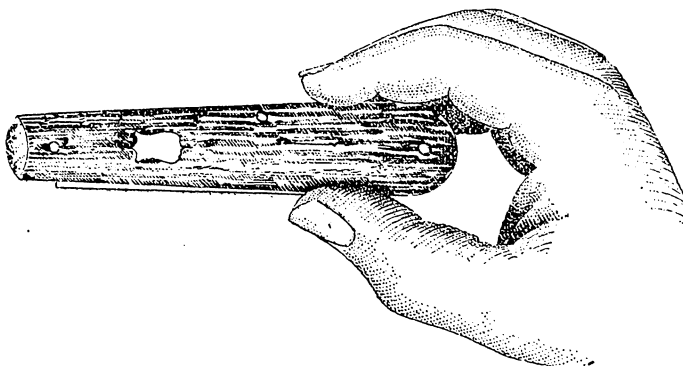


Fig. 2.—Closing the Knife.

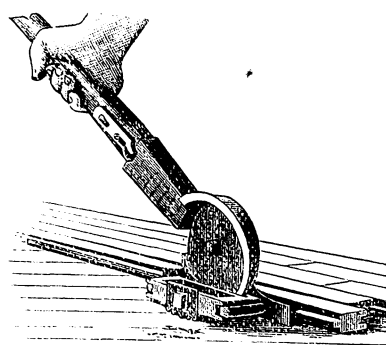
against the blade. The free end of the knife is then struck lightly on a counter or some solid substance, which jars the lug out of the hole in the blade and back into a hole in the handle. The finger is removed as the knife is struck and the blade flies open of its own accord. To close the knife it is held as in Fig. 2, with the shield up, and the blade is pushed home with the forefinger, when the end of the knife is struck, jarring the lug back into the hole in the blade, holding it securely closed. The blade cannot be opened or closed in the ordinary manner. Samples will be sent, prepaid, by mail at \$4 per dozen.

#### Troy Polishing Irons No. 80.

N. R. Streeter & Co., Groton, N. Y., New York office, W. H. Jacobus, 90 Chambers street, New York, are putting on the market their No. 80 polishing iron of the Troy pattern. The company call especial attention to the fact that the corrugations are thoroughly cleaned of sand. The company give greater attention to that part of the iron, exercising special care in its manufacture.

and the handle pulled up until the board is forced home, where it will stay without holding, it is explained, until the nailing is done. The handle is made to swing out of the way if brought down near enough to the edge of the board to interfere with nailing. The point is made that the jack is not

usually required on the body of a floor where the boards run straight and are easily driven up, but that it is particularly needed on crooked or poorly matched boards, and near walls, where there is not room to drive. It is stated that where a particularly fine floor is



The Handy Floor Jack.

required the jack should be used on every board, and that its use will save time and give superior results. The manufacturers refer to the jack as quick, powerful and cheap.

### The Taintor Positive Saw Set No. 93.

Taintor Mfg. Company, Wiebusch & Hilger, agents, 84-86 Chambers street, New York, have produced an improved

the punch. It is remarked that the placing of the washer between the anvil and the frame, instead of beneath the frame, raises the anvil the thickness of the washer, dividing the difference between the two lengths of any face of any section, causing the set

crease or leave tool marks on the outside of the tooth. It is stated that the set is not liable to break with any reasonable use, and that all broken parts will be replaced by the manufacturers.

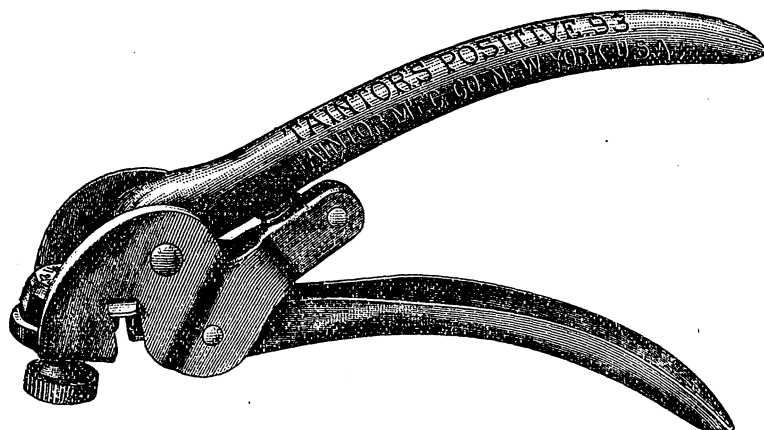


Fig. 1.—The Taintor Positive Saw Set No. 93.

form of their saw set, to be known as No. 93, as shown in Fig. 1, and with which, we are advised, all orders will hereafter be filled. The set is made of



Fig. 2.—Side View of the Anvil.

sheet steel and with the exception of the anvil and punch, which are of tempered tool steel, is full nickel plated. Compressing the handles of



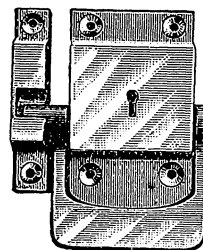
Fig. 3.—Top View of the Anvil.

the set, both of which move, bends the tooth of the saw to conform to the face of the anvil, while the face of the anvil opposite the punch determines the set of the saw. The anvil, Figs. 2 and 3,

to bend the tooth nearer the point, giving two adjustments to a face, or 20 adjustments in all. Thus, if in setting a fine tooth face No. 1 bends the tooth too much the washer is put under the anvil and face No. 3 is used. It is explained that all the faces in a section take the same hold of a tooth, but that the higher numbers bend the tooth more than the lower ones do, also that face No. 4 will set a medium saw about right for general work, and that it can be used as a trial face. The faces being numbered enables the operator to keep a record of the set a saw has received and to give the saw the same set again. It is suggested that the number of the face might be put on the saw handle, so that the operator may at any time reproduce the same setting to obtain the same clearance. In operation the tool is placed on the saw, resting on the teeth, with the punch at the back of the tooth to be set. The handles are compressed with sufficient force to press the tooth hard against the anvil, but not enough to crush or to draw it out of shape. The tooth is in plain sight while being set, so that all the teeth may be set with accuracy; and the saw while being set may be held in the hand or rested on its back on a bench or held in a vise.

### Refrigerator Door Fastener and Lock.

P. J. Conroy & Co., Philadelphia, Pa., are offering a refrigerator door fastener and lock, as here shown. It is explained that in closing the door the top part of the cam strikes a curve at the back of the catch and forces the handle down, automatically making a tight joint, so essential to refrigerators. When opening the door the handle is lifted a quarter of a circle, and the top of the cam strikes the curve in the catch and forces the door open. It is pointed out that the door shuts or opens with ease and that no springs are used in the construction of the fastener. The fastener is also provided with a serviceable lock of new design. The fasteners are made in different sizes and styles in brass and bronze metal. The makers state that the goods are simple, strong and durable, and that as their business



Refrigerator Door Fastener and Lock.

is confined to the manufacture of hardware for refrigerators their energies are devoted to producing new and desirable articles in this line.

### L. F. & C. Bread Knife.

Landers, Frary & Clark, New Britain, Conn., and 298 Broadway, New York, are offering a bread knife as here shown. The blade is 10 inches long, with a polished beech handle. The opposite side of the blade is beveled at the edge, as shown in Fig. 2. The manufacturers remark that experiments with all kinds of saw edge or scalloped edge bread knives prove that the only



Fig. 1.—L. F. & C. Bread Knife.

has ten faces, divided into sections, marked F for fine, M for medium and C for coarse, indicating the faces to be used in setting fine, medium and coarse teeth. In use the face that bends the

The points of excellence claimed for the set by the manufacturers include the following: That the set will do anything any other set will do, also some things peculiar to itself; that the tool

use of the saw tooth or scalloped edge is to cut through the crust, and that after this has been done a straight edge is better than any other kind. It is stated that the knife illustrated has just

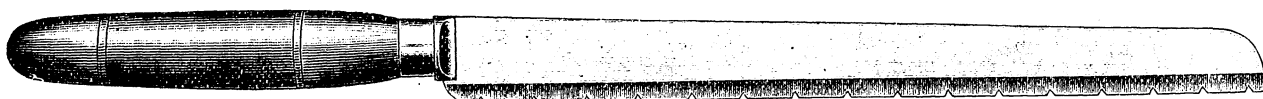


Fig. 2.—The Reverse Side of Bread Knife.

tooth the right distance from the point is first found; then the number of face in that section that bends the tooth the right amount is selected. The anvil is then tightened by the aid of the knurled screw, with the desired face opposite

has but one gauge to set; that the tool will set nearer the point and consequently will set a finer tooth, as the set cannot slip on the tooth; that the tool gives the same clearance to a thick or thin saw, and that the set does not

enough teeth to cut through the crust quickly, but not enough to pull and tear soft bread underneath the crust; and that the knife is warranted to cut bread and cake quickly, evenly and with a minimum amount of crumbs.

### The Fox Corrugated Side Steel Sash Pulley.

The accompanying cuts relate to a steel sash pulley offered by the Fox Machine Company, 135 North Front street, Grand Rapids, Mich. The pulley

time has now arrived, with a settled tariff, to commence the industry.

### The Columbian Sash Balance.

The accompanying cut represents a sash balance being introduced by J. M.

corner of the sash and the other end at the other corner, while the middle of the cord is in the middle of the balance, consequently, it is remarked, no slipping can occur. It is stated that the device will balance a sash of any weight, from 5 to 25 pounds, and that by a slight variation it will balance sash from 1 to 100 pounds, or more. The balance is adjusted, making it weak or strong, by the use of a key, there being two key holes through the casing head, one opposite each shaft, which holes may be ornamented with a silvered or nickeled escutcheon. The makers claim that the balance is simple and durable; that it exactly balances the sash at any point; that it works without a friction screw; that it requires no space between the window frame and studding, thus allowing the plastering to be joined closely to the window frame, while the frame may be nailed firmly to the studding; that it can be used on twin windows, leaving only  $\frac{1}{8}$  inch between the two windows; that it is free from noise, and that it can be used on old windows which were not designed to be hung with weights.

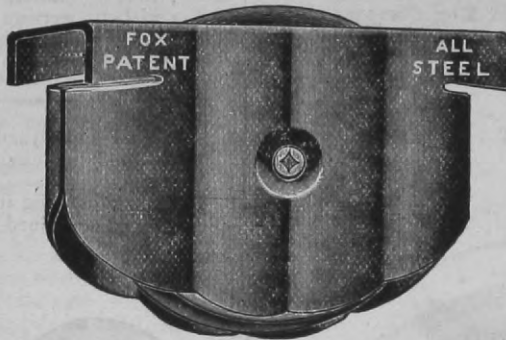


Fig. 1.—Corrugated Side Steel Sash Pulley.

is shown in Fig. 1, and the manner in which it is applied is illustrated in Fig. 2. The pulley is referred to as being

Smelser and manufactured by the Safety Gate Company, Richmond, Ind. The balance is placed on the center of the

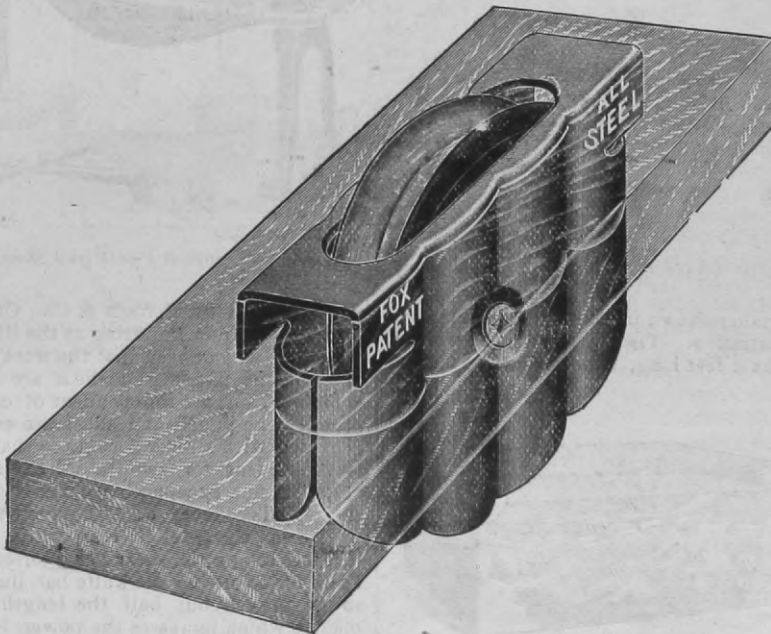


Fig. 2.—Pulley Applied.

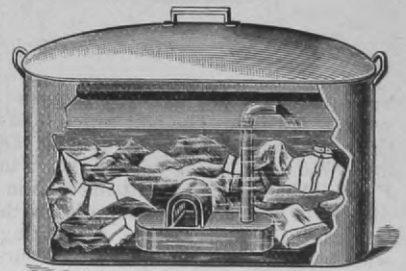
very light, strong and as admitting of rapid insertion in position. It is pointed out that the round end of the shoulder gives the pulley a firm support in the jamb, enabling the pulley to effectually resist the continual strain of the weight. It is explained that there is no splitting of the jambs when inserting the pulley, as the shoulder fits snugly in the mortise and can be pushed down as far as the projections, which, when driven down, form a staple, holding the shoulder firmly in position. The full circle at each end insures the cord always remaining on the pulley. The makers state that one push with a four-hole bit cuts the mortise, and that one blow and a few taps on the side will force the pulley into position, no nails or screws being required.

The Cleveland *Leader* states that the Britton Rolling Mill Company of that city will start their tin plate plant very shortly. The concern were organized to manufacture tin plates, among other things, and the firm believe that the

window head, requiring a space of  $4\frac{1}{2}$  inches in height, and when the window

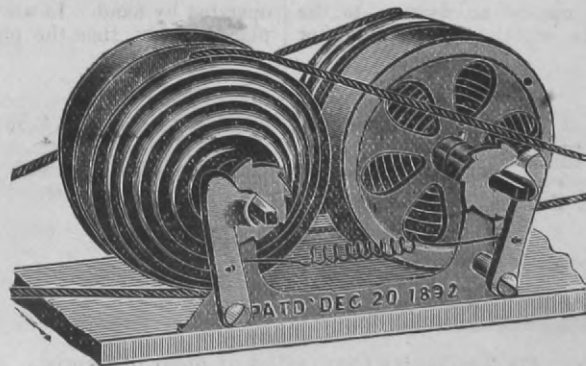
### Bolgiano's Steam Clothes Washer.

The accompanying cut represents a steam clothes washer, offered by the Bolgiano Mfg. Company, Baltimore, Md. The washer is placed in the bottom of a wash boiler and weighted down with an iron or brick to keep it in place. Water is put into the boiler



Bolgiano's Steam Clothes Washer.

until it comes within an inch of the top of the spout. The clothes are then put in and allowed to boil for ten minutes after the water comes to a boil. At the expiration of the time the clothes, it is stated, will be all washed. The makers claim that the washer saves



The Columbian Sash Balance.

is finished it is entirely inclosed and out of sight. There is but one cord to each sash, one end of which is secured at one

all scrubbing, as it draws the dirt out of the clothes through a powerful suction.



### The Perfect Roller Chafe Iron.

The accompanying illustrations relate to a roller chafe iron put on the market by the Bellamy Company, 243 Pearl street, New York. The feature in the construction of the iron consists in a cone shaped roller working on a cone shaped bearing held in place by a spiral spring, so as to admit of all wear

cost. The chafe iron is made in two sizes—No. 1 for buggies and No. 2 for surreys and light business wagons. The manufacturers are introducing the chafe iron through the hardware trade.

### Bolgiano One-Minute Dish Washer.

The Bolgiano Mfg. Company, Baltimore, Md., are introducing the dish

washer shown in the accompanying illustration. The washer consists of a box 2 feet long, 1 foot wide and 1 foot deep, with a hinged lid. Inside, near the bottom, is a skeleton tray, on which the dishes are placed. At the right hand end is a propeller wheel to be operated by hand. In use the cups are placed in first, then the plates and the

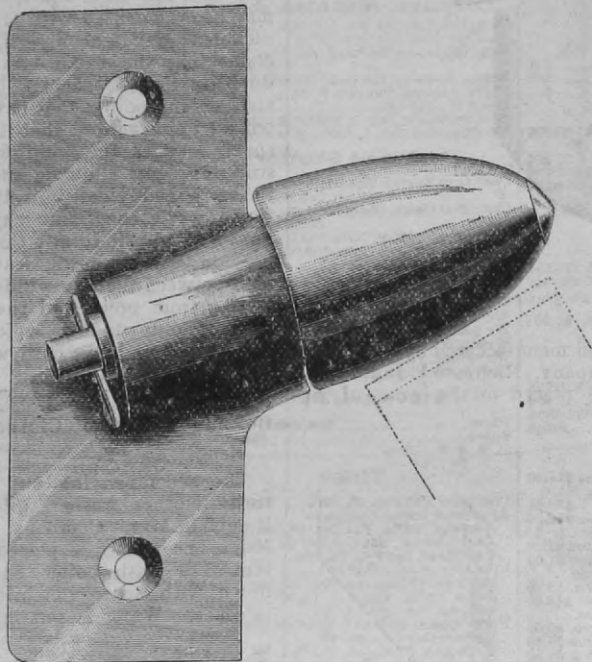
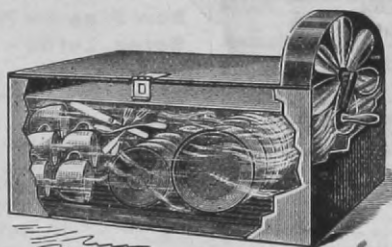


Fig. 1.—The Perfect Roller Chafe Iron.

being taken up automatically, thus preventing rattling. The bolt which holds the roller in position is secured at the lower end by a spring key, as shown in Fig. 1. The cone is babbitt lined, as indicated in Fig. 2, and is supplied with lubricant through a hole connecting with the lubricant chamber which surrounds the bolt, indicated in Fig. 2 by the darker shading. The chamber is filled at the factory with paste lubricant of such consistency as to constantly supply the necessary amount of lubrication. In Fig. 1 the position in which the tire of the wheel comes in contact with the roller is shown by dotted lines, thus preventing the tire being worn round on the edges. The manufacturers claim that the pressure is always on the center of the tire, causing the roller to revolve; that the pressure is direct through the spoke to the hub; that there can be no damage to the paint or the wheels by scratching or

washer shown in the accompanying illustration. The washer consists of a box 2 feet long, 1 foot wide and 1 foot



Bolgiano's One-Minute Dish Washer.

deep, with a hinged lid. Inside, near the bottom, is a skeleton tray, on which the dishes are placed. At the right hand end is a propeller wheel to be operated by hand. In use the cups are placed in first, then the plates and the

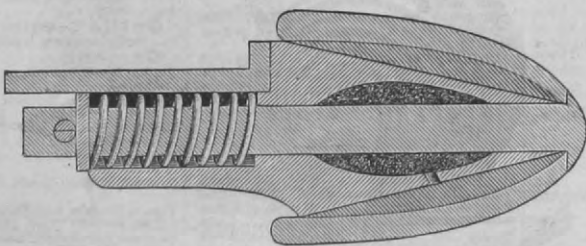


Fig. 2.—Showing Construction of Roller and Spring.

straining; that the working of the roller is unaccompanied by noise, and that the use of the device results in a great saving of wheels. The point is made that all parts are interchangeable, and that they can be replaced at a sight

saucers and the washer filled with hot water up to the center of the wheel. The lid is closed and the handle turned, and if turned rapidly, it is stated, the dishes can be washed in half a minute. After the dishes are washed the screw

### Bertsch's Combined Punch and Shear.

The accompanying illustration shows an improved combined punch and shear



Bertsch's Combined Punch and Shear.

manufactured by Bertsch & Co., Cambridge City, Ind. Referring to the illustration, it will be seen that the working parts of the punch and shear are not combined, but are independent of each other. The punch and shear are each provided with a lever socket, so that it is convenient for two to use the machine at once, except when cutting long sheets. The lever on the punch will work from the front or rear, while the lever socket on the shear has a series of holes for adjusting the knife bar links, so as to cut but half the length of blades, which increases the power, it is claimed, from 50 to 100 per cent. The knife bar has a bearing on the rear side to prevent springing. With the tool are furnished three sets of punches and dies, back gauge, improved side pin gauge for punching holes at equal distances apart without marking off and strengthening bolts for the deep throat punches. The machine is intended for light and heavy sheet iron workers, and is made in eight sizes with 4, 8, 12, 15 and 18 inch throat punch, adapted to punch flange and angle iron, and has 8, 10, 12 and 18 inch blades to cut round or flat bar iron in sheets up to  $\frac{3}{4}$  inch plate.

F. R. Phillips of the Phillips Tin Plate Company, Philadelphia, reports a better demand for tin plate machinery, he having contracted last week for an entire new plant, and expected to close for two more this week. Every facility, we understand, is offered to see the machinery running on the finest grades of plates with different weights of coating. The plates made by this concern are, we understand, used extensively in Philadelphia, Boston and New York.

# Current Hardware Prices.

SEPTEMBER 19, 1894.

NOTE.—The quotations given below represent Current Hardware Prices, whether made by manufacturers or jobbers. They apply to such quantities of goods as are usually purchased by retail Hardware merchants. Very small orders and broken packages often command higher prices.

The character @ is used to indicate a range of price: thus discount 50 & 10% @ 50 & 10 & 5%, signifies that the goods in question are sold at prices ranging from 50 & 10% to 50 & 10 & 5%.

## Adjusters, Blind—

Domestic.....\$ dos \$3.00, 33% @ 33% & 10%  
Excelsior.....\$ dos \$10.00.....50 & 10 & 25  
North.....\$ dos \$10.00.....11 @ 11%  
Zimmerman's—See Fasteners Blind.

## Ammunition—See Caps, Cartridges, Shells, &c.

## Anvils—

### American—

Eagle Anvils, \$ 9 @.....15 @ 15 & 5  
Horse shoe brand, Wrought.....11 @ 11%  
Moore & Barnes Mfg. Co.....33%

### Imported—

Armstrong Mouse Hole.....33% @ 33%  
S. & H. machine finished.....93% @ 10%  
Trenton.....93% @ 9%  
Wilkinson's.....93% @ 9%  
Peter Wright's.....93% @ 9%

## Anvil Vise and Drill—

Allen Anvil and Vise \$3.00.....40 & 10%  
Cheney Anvil and Vise.....25%  
Willers Falls Co., \$18.00.....20%  
Holt's.....40 @ 40 & 10%

## Apple Parers—See Parers Apple, &c.

## Augers and Bits—

Boring Machine Augers.....70 @ 70 & 10%  
Car Bits, 12-in. twist.....50%  
Common Augers and Bits.....70 @ 70 & 10%  
Cincinnati Bell Hangers' Bits.....80 & 10  
Forester Pat. Auger Bits.....25%  
Jennings' Pattern Car Bits.....40%  
Jennings' Pattern Auger Bits.....60%  
J. E. Jennings & Co., No. 10, extension  
lip.....40%  
O. E. Jennings & Co., No. 30.....40 @ 40 & 10%  
O. E. Jennings & Co., Auger Bits, 1 set  
82% quarters, No. 5; No. 30, \$3.50, 25%  
Russell Jennings' Augers and Bits 25 & 10%  
Lewis' Patent Single Twist.....45%  
L'Hommedieu Car Bits.....15 & 10%  
Pugh's Black.....20%  
Pugh's Jennings Pattern.....20%  
Snell's Bits.....60 & 5 @ 60 & 10%

## Bit Stock Drills—

Cleveland.....60 & 10 & 5%  
Cincinnati, for wood.....30 & 10%  
Cincinnati, for metal.....45 & 10%  
Cincinnati Twist Drills.....50 & 10 & 5%  
New Process Twist Drill Co.....50 & 10 & 5%  
Standard.....50 & 10 & 5%  
Syracuse, for metal.....50 & 10 & 5%  
Syracuse, for wood (wood list) 30 & 10 & 40%

## Expansive Bits—

Clark's small, \$18; large, \$26.....40 @ 40 & 5%  
Ives' No. 4.....40 @ 40 & 10%  
Steer's, No. 1, \$26; No. 2, \$18.....30 @ 40 & 5%  
Stearns' No. 2, \$48.....90%  
Swan's.....40 @ 40 & 10%

## Gimlet Bits—

See.....25 @ 25 & 10%  
Common.....\$ dos \$2.50 @ \$3.00  
Diamond.....\$ dos \$1.25.....40 & 10%  
Double Cut:  
Hartwell's.....\$ gro. \$10.00.....40 & 10%  
Douglass.....40 & 10 @ 50%  
Ives.....60 & 10 @ 60 & 10 & 5%  
Shepardson's.....45 & 10 @ 45 & 10 & 5%

## Hollow Augers—

Bonney's Adjustable, \$ dos \$48.....60%  
Cincinnati Adjustable.....25 & 10%  
Cincinnati Standard.....25 & 10%  
Douglass.....33% @ 33% & 10%  
French, Swift & Co. (Beecher)  
Ives.....33% @ 33% & 10%  
Ives' Expansive, each \$4.50.....50 & 5%  
Stearns.....20 & 10%  
Universal Expansive, each \$4.50.....20%  
Wood's, \$ dos, \$48.....25 & 10%

## Ship Augers and Bits—

L'Hommedieu's.....15 & 10 @ 15 & 10 & 5%  
Snell's.....25 @ 25 & 10%  
Snell's Ship Auger Pattn' Car Bits  
Watrous.....15 & 10 @ 15 & 10 & 5%  
Watrous.....25 @ 25 & 10%

## Awl Hafts—See Hafts, Awl.

## Awls—

Brad, Handled.....\$ gr. \$2.50 @ \$3.00  
Brad, Shoulders.....\$ gr. \$1.30 @ \$1.40  
Feg, Pat.....\$ gr. \$3.50 @ \$3.80  
Feg, Should.....\$ gr. \$1.50 @ \$1.65  
Scratch, Handled.....\$ gr. \$4.00 @ \$4.50  
Scratch, Socket.....\$ dos \$1.10 @ \$1.20

## Awl and Tool Sets—See Sets, Awl and Tool.

## Axes—

First quality, best brands.....\$6.00 @ \$8.50  
First quality, other brands.....5.50 @ 6.00  
Beveled add 50% \$ doz.

## Axle Grease—See Grease, Axle.

## Axles—

No. 1 Common.....36 @ 36%  
No. 2 Common.....44 @ 44%  
Nos. 7 to 14.....70%  
Nos. 15 to 22.....47%  
Nos. 19 to 22.....70% 3% cash  
Concord Axles, loose collar  
Concord Axles, solid collar  
Tubular Axles.....50%

## Bag Holders—See Holders, Bag.

## Balances—

Sash—  
Caldwell, low list.....30%  
Pullman.....60%  
Sensible.....60%

## Spring—

Spring Balances.....40 & 10 @ 50%  
No. 2000.....30  
Chattillon, \$ dos.....\$2.00 0.95 1.75 net  
Chattillon Straight Balances.....40 @ 40 & 10%  
Chattillon Circular Balances.....50 & 10%

## Barb Wire—See Wire, Barb.

## Bars—

### Crow—

Cast Steel.....\$ 2 @ 2%  
Iron, Steel Points.....\$ 2 @ 2%  
Cast Steel.....\$ 2 @ 2%

## Basins, Wash—

Standard Fiberglass, No. 1, 10% in., \$1.80;  
12-inch, \$2.00; 18-inch, \$2.50.

## Beams Scale—

Scale Beams, List Jan. 12, '82.....50 & 10 @ 50 & 10 & 5%  
Chattillon's No. 1.....40%  
Chattillon's No. 2.....50 & 10 @ 50 & 10 & 5%  
Custers'.....33%

## Beaters—

### Egg—

Bryant's.....\$ gross \$14.00  
Double (H. & R. Mfg. Co.) \$ gro. No. 0  
\$12.00; No. 1, \$15.00; No. 2, \$30.00  
Dover.....\$ dos \$1.00; \$ gro. \$10.50  
Dover, Ex. Family Size.....\$ doz. \$3.50  
Dover (Standard Co.).....\$ doz \$1.00  
Duplex (Standard Co.).....\$ doz \$1.00  
Duplex Extra Heavy (Standard Co.)  
\$ doz \$3.50  
Easy (H. & R. Mfg. Co.).....\$ gro \$12.00  
Improved Acme (H. & R. Mfg. Co.)  
\$ gro. \$9.00  
Silver & Co.....\$ gro \$5.50  
Spiral.....\$ gro \$4.25 @ \$4.50  
Triple (H. & R. Mfg. Co.).....\$ gro \$15.50

### Culinary—

Keystone, P. D. & Co., Each, No. 1, \$1;  
No. 2, \$2.....20%

## Bells—

### Cow—

Common Wrought.....60 & 10%  
Kentucky Durham.....70 & 10%  
Kentucky, Sargent's list.....70 & 10%  
Kentucky, "Star".....20 & 10%  
Texas Star.....50 & 10 @ 50 & 10 & 5%  
Western, Sargent's list.....70 & 10%

### Door—

Crank, Brooks'.....50 & 10 & 2%  
Crank, Cone's.....10%  
Crank, Connel's.....20 & 10%  
Gong, Abbe's.....35 & 10%  
Gong, Barton's.....40 & 10 @ 50%  
Gong, Yankee.....45 & 10%  
Lever, R. & E. Mfg. Co.....50 & 10 & 2%  
Lever, Sargent's.....60 & 10%  
Lever, Taylor's Bronzed or Plated.....net  
Lever, Taylor's Japanned.....25 & 10%  
Full, Brook's.....50 & 10 & 2%

### Electric—

Bigelow & Dowse.....20 @ 20 & 10%  
Wollensak's.....20 @ 20 & 10%

### Hand—

Extra Heavy Brass.....70%  
Light Brass.....70 & 10 @ 70 & 10 & 5%  
Silver Chime.....35 & 10%  
White.....70%  
Globe Cone's (Patent).....25 & 10 @ 35%

### Miscellaneous—

Call.....45 @ 50%  
Farm Bells.....\$2.25  
Steel Alloy Church and School Bells.....50%

## Bellows—

Blacksmith's.....60 & 10 @ 60 & 10 & 70%  
Hand Bellows.....40 & 10 @ 40 & 10%  
Molders'.....40 & 10 @ 50%

## Belting, Rubber—

Common Standard.....75 & 10 @ 75 & 10 & 5%  
Extra.....60 & 10 @ 60 & 10 & 5%  
Standard.....60 & 10 @ 75%  
N.Y.B. & P. Co., Carbon.....60 & 10 & 5%  
N.Y.B. & P. Co., Double Diamond.....60%  
N.Y.B. & P. Co., 1840 Para.....40 & 10%

## Bench Stops—See Stops, Bench

## Benders and Upsetters, Tire—

Detroit Perfected Tire Bender 15 & 16%  
Green River Tire Benders and Upsetters.....50%  
Stoddard's Lightning Tire Upsetters.....15%

## Bits—

Auger, Gimlet, Bit Stock Drills, &c.,  
see Augers and Bits.

## Bit Holders—See Holders.

## Blind Adjusters—See Adjusters, Blind.

## Blind Fasteners—See Fasteners, Blind.

## Blind Staples—See Staples, Blind.

## Blocks—

Cleveland Block Co., Mal. Iron.....50 & 10 @ 50 & 10%  
Moore's Novelty, Mal. Iron.....50 @ 50 & 10%  
S.W. Grin Steel & Machine Works 25 @ 25 & 10%  
See also Machines Hoisting.

## Boils—

## Carriage, Machine, &c.—

Com. list June 10, '84.....80 & 10 @ 80 & 20%  
Charter Oak, list Oct. 1884.....80%  
Genuine Eagle, Norway, list Oct. '84.....80%  
Eagle, Norway, list Oct. '84.....80 & 10 @ 80 & 15%  
Phila. pattern, list Oct. 7, '84.....80%  
R. B. & W., old list.....70%  
Bolt Ends, list Jan. 1, 1890.....80 & 10 @ 80 & 20%  
Machine, list Jan. 1, 1890.....80 & 10 @ 80 & 20%

## Door and Shutter—

Cast Iron Barrel Square, &c.....75 & 10 @ 75 & 10 & 5%  
Cast Iron Chain (Sargent's list).....65 & 10 @ 65 & 10 & 5%  
Cast Iron Shutter Bolts.....75 & 10 @ 75 & 10 & 5%  
Ives' Patent Door Bolts.....60 & 10 @ 60 & 10 & 10%  
Wrought Barrel.....75 & 10 @ 80%  
Wrt B. K. Flush Common.....60 & 10 @ 60 & 10 & 10%  
Wrt Shutter, Brass Knot's list.....50 & 10 @ 50%  
Wrt Shutter, Sargent's list.....60% @ 70%  
Wrt Shutter, all iron, Stanley's.....60% @ 70%  
Wrought Square.....75 & 10 @ 80%  
Wrt Sunk Flush, Sargent's list.....60 & 10%  
Wrt Sunk Flush, Stanley's list.....60 & 10%

## Stove and Plow—

Plow.....60 & 10 @ 60 & 10 & 10%  
Stove.....65 @ 70 & 5%  
R. B. & W., Plow.....5%

## Tire—

Common, list Feb. 28, '83.....70 @ 70 & 10%  
American Screw Company  
Norway, Phila., list Oct. 16, '84.....80%  
Eagle, Phila., list Oct. 16, '84.....80%  
Bay State, list Feb. 28, '83.....75%  
Franklin Moore Co.:  
Norway, Phila., list Oct. 16, '84.....80%  
Eagle, Phila., list Oct. 16, '84.....80%  
Kilpise, list Feb. 28, '83.....75%  
Port Chester Bolt and Nut Company.  
Empire list Feb. 28, '83.....80%  
Keystone, Philadel., list Oct. '84.....80%  
Norway, Phila., list Oct. '84.....80%  
R. B. & W., Philadel., list Oct. 16, '84.....85%

## Borers, Tap—

Common and Ring.....20 & 10%  
Clark's.....33% @ 35%  
Enterprise Mfg. Co.....25%  
Ives' Tap Borers.....33% @ 35%

## Boring Machines—See Machines, Boring.

## Bow Pins—See Pins, Bow.

## Boxes, Letter—

Tatum's.....40

## Boxes, Wagon—

Per D.....2% @

## Boxes, Miter.

Spilker's Excelsior, 3 in. \$7.50, 4 in.  
\$8.50, 5 in. \$13.00, 6 in. \$15.00.....20%

## Braces—

None.—Most Braces are sold at net prices.  
Barber's.....50 & 10%  
Bartholomew's.....50 & 5%  
Common Ball, American.....\$1.00 @ \$1.10  
Davis Patent.....60 & 10%  
Fray's Genuine Spotted's.....50 & 10 & 5%  
Fray's Nos. 70 to 120, 81 to 123, 207 to 414  
50 & 10 & 5%  
Ives' New Haven Novelty.....70 @ 70 & 5%  
New Haven Ratchet.....60 & 5 @ 60 & 10%  
Barber Ratchet.....60 & 5 @ 60 & 10%  
Barber's.....60 & 5%  
Spotted's.....60 & 5 @ 60 & 10%  
P. & W. Co., Peck's Patent.....60%  
Rose & Johnson.....50%

## Brackets—

Shelf, fancy  
Sargent's list.....70 @ 70 & 10%  
Other makes at a wide range of prices.  
Shelf, plain  
Regular, list.....65 @ 70%  
Sargent's list.....60 & 10 @ 70 & 10%  
Bradley Shelf Brackets.....70 & 10%

## Bright Wire Goods—See Wire.

## Broilers—

Hend's Self-Inch.....9 10 9 11  
Basting.....\$4.50 5.50 6.50  
Morgan Odorous.....\$ doz. \$12.50  
New Haven.....50%  
Queen City.....33%  
Wire Goods Co.....65 & 10%

## Buckets, Well and Fire—

See Pails.

## Bull Rings—See Rings, Bull.

## Butcher's Cleavers—See Cleavers, Butcher's.

## Butts—

Brass—  
Cast Brass, Fast.....33% @ 10%  
Cast Brass, Loose Joint.....33% @ 10%  
Cast Brass, Tiebout's.....50%  
Wrought Brass.....80 & 10 @ 80 & 20%

## Cast Iron—

Fast Joint, Broad.....60 & 10 @ 60 & 10 & 10%  
Fast Joint Narrow.....60 @ 60 & 10%

## Loose Joint, Japanned.....75 & 10 @ 80%

Loose Joint, Jap, with Acorns.....40%  
Loose Pin, Acorns, Japanned.....50%  
Loose Pin, Acorns, Japanned,  
Plated Tips.....50%  
Mayer's Hinges.....50%  
Parliament Butts.....50%

## Wrought Steel—

Fast Joint, Broad.....40%  
Fast Joint, Narrow.....40%  
Fast Joint, Lt. Narrow.....40%  
Inside Blind, Light.....40%  
Inside Blind, Regular.....40%  
Loose Joint, Broad.....40%  
Loose Pin, Acorns, Japanned.....40%  
Table Butts, Back Flaps, &c.....40%  
Bronzed Wrought Butts.....50 & 10 @ 50 & 10 & 5%

## Cages, Bird—

Hendryx Brass:  
3000, 5000, 1100 series.....10%  
1200 series.....40%  
200, 300, 600 and 800 series.....40 & 10 @ 50%  
Hendryx Bronze:  
700, 800 series.....40 & 10 @ 50%  
Hendryx Enameled.....40 & 10 @ 50%

## Calipers—See Compasses.

## Calks Toe—

Burke's, One Prong, Blunt.....4 @ 45%  
Burke's, One Prong, Sharp.....5 @ 45%  
Burke's, Two Prong, Blunt.....5 @ 45%  
Burke's Two Prong, Sharp.....6 @ 45%  
Gautier, One Prong, Blunt.....5 @ 45%

## Can Openers—See Openers, Can.

## Cans Milk—

S. S. & Co.: 5-gal. \$3.00; 8-gal., \$4.40;  
10-gal., \$4.75 each.....40 & 10%

## Cans Oil—

Galvanized Blue Band, 1 gal., \$ dos \$2.50  
Galvanized Blue Band, 5 gal., Tip-Top,  
\$ dos \$12.50  
Galvanized Blue Band, 5 gal., Faucet,  
\$ dos \$2.50  
Glass Oil, Friend.....\$ dos \$2.75

## Caps—Percussion—

Hicks & Goldmark's and Union Metallic  
Cartridge Co.....\$ 1000  
Eley's E. B.....50 @ 55%  
Eley's D Waterproof, Central Fire, 1.50  
E. B. Grad. Edge, Cent. Fire, 1-10's 47 @ 50  
E. B. Trimmer Edge, 1-10's.....47 @ 50  
F. L. Waterproof, 1-10's.....35 @ 37%  
G. D.....27 @ 30%  
Musket, Waterproof, 1-10's.....50 @ 55%  
S. B. Genuine Imported.....60%

## Primers—

Berdan Primers, \$1.00.....33  
B. L. Caps (Sturtevant's) \$1.00.....33  
All other Primers, \$1.50.....33

## Cards—

Watson's Cotton, Wool, Horse and  
File, list January 28, 1891.....

## Carpet Stretchers—

See Stretchers, Carpet.

## Cartridges—

B. B. Caps, Conf. Ball, Swgd., \$1.85 @ \$1.90  
B. B. Caps, Round Ball.....\$1.80 @ \$1.90  
Blank Cartridges, except 22 and 32 cal.,  
additional 10% to above discounts.....33  
Blank Cartridges, 22 cal., \$1.75.....33  
Blank Cartridges, 32 cal., \$3.50.....25 & 10%  
Cent. Fire, Military and Sporting 15 & 25  
Cent. Fire, Pistol and Rifle.....25 & 10%  
Primed Shells and Bullets.....15 & 25%  
Rim Fire Cartridges.....60 & 10%  
Rim Fire Military.....15 & 25%

## Carpet Sweepers—

See Sweepers, Carpet.

## Casters—

Bed.....  
Plate.....60 & 10 @ 60 & 10 & 10%  
Shallow Socket.....  
Deep Socket.....60%  
Giant Truck Casters.....35%  
Gwinner's Common Sense.....45 @ 50%  
Gwinner's Hercules.....45 @ 50%  
Martin's Patent (Phoenix).....45 @ 50%  
Payson's Anti-Friction.....70 @ 75 & 10%  
Payson's Truck.....60 & 10 @ 60 & 10%  
Socket Truck Casters.....50 @ 55 & 10%  
Stationary Truck Casters.....\$ 100  
Tatum's Truck.....60 @ 60 & 10%  
Tucker's Patent, low list.....45%  
Yale Casters, low list.....45%  
Yale, Gem.....70%

## Cattle Leaders—

See Leaders, Cattle.

## Cement—



**Chalk Lines—See Lines.****Checks, Door—**

Barley's ..... 20%  
 Unity ..... 50%

**Chisels—****Socket Framing and Firmer**

Ohio Tool Co. .... 75¢100¢80%  
 P. S. & W. ....  
 Withersby .....  
 Buck Bros. .... 30%  
 Charles Buck ..... 30%  
 Douglass ..... 30%  
 Merrill ..... 30%  
 L. & J. J. White ..... 30%  
 Tanged and Miscellaneous  
 Buck Bros. .... 30%  
 Charles Buck ..... 30%  
 Butcher ..... 30%  
 Spear & Jackson's ..... 30%  
 Tanged Firmers ..... 30%  
 L. & J. J. White, Tanged ..... 30%  
 Cold Chisels, fair quality, 1/2" ..... 14¢16¢

**Chucks—**

Beach Pat. .... each, \$3.00 ..... 20%  
 Danbury ..... each, \$3.00, 30¢30¢25%  
 Graham Patent ..... 38%  
 Morse's Adjustable, each, \$7.00, 20¢20¢25%  
 Syracuse, Bais Pat. .... 25%  
 Skinner Patent Chucks ..... 40%  
 Combination Lathe Chucks ..... 25%  
 Drill Chucks ..... 40%  
 Independent Lathe Chucks ..... 40%  
 Planer Chucks ..... 20%  
 Universal Lathe Chucks ..... 40%

**Churns—**

McDonald Star Barrel Churn, each  
 6 gal., \$2.60; 10 gal., \$2.75; 15 gal.,  
 \$3.00; 20 gal., \$3.25.  
 Tinn Union, each, 5 gal., \$3.25; 7 gal.,  
 \$3.75; 10 gal., \$4.25.

**Clamps—**

Adjustable, Cincinnati ..... 15¢10%  
 Adjustable, Hammers ..... 15¢15¢25%  
 Adjustable, Stearns' ..... 30¢30¢10%  
 Barnes' Machinists' Clamps ..... 35%  
 Cabinet, Sargent's ..... 25¢10%  
 Carpenter, Cincinnati ..... 25¢10%  
 Carriage Makers', P. S. & W. Co. .... 40¢10%  
 Carriage Makers', Sargent's ..... 75¢75¢5%  
 Eberhard Mfg. Co. .... 40¢40¢10%  
 Joiners' Clamps, Tatum's ..... 25¢10%  
 R. I. Tool Co.'s Wrought Iron ..... 25%  
 Saw Clamps, See Vises, Saw Filers  
 Stearns' Malleable, with Wrought Iron  
 Screw ..... 75¢75¢5%  
 Stearns' Steel ..... 25%  
 Warner's ..... 40¢10%40¢10%5%

**Cleavers, Butchers—**

Beatty's ..... 40¢40¢10%  
 Bradley's ..... 25¢30%  
 Foster Bros. .... 40%  
 New Haven Edge Tool Co.'s ..... 40%  
 Nichols Bros. .... 30%  
 P. S. & W. .... 35%40¢35%  
 Schulte, Lohoff & Co. .... 40¢40¢5%  
 L. & J. J. White ..... 25%

**Clips—**

Baker Axle Clips ..... 25¢25¢5%  
 Norway, A. S. ..... 60¢10%  
 Norway Spring Bar Clips ..... 65¢65¢5%  
 ad grade Norway Axle ..... 70%  
 Steel Felloe Clips ..... 70%  
 Superior Axle Clips ..... 70%  
 Wrought Iron Felloe Clips ..... 70%

**Cloth and Netting, Wire**

See Wire, &c.

**Cockeyes—**

See Wire, &c.

**Cocks Brass**

Hardware List (Globe, Kerosene, Lever  
 Bibbs, Racking, &c.) ..... 60¢60¢10

**Coffee Mills—See Mills, Coffee****Coffee Dog**

Braze, Pope & Stevens' list ..... 40%  
 Chapman Mfg. Company, new list ..... 40%  
 Embossed, Gift, Pope & Stevens' list 30¢10%  
 Leather, Pope & Stevens' list ..... 40%  
 Medford Fancy Goods Co. .... 40¢10%50%

**Combs Curry**

American Curry Comb Co. .... 35%40%  
 Fitch's ..... 60¢10%50¢10%  
 Gibb's Magnetic ..... 70%  
 Kohler's Humane ..... 17%  
 Kohler's Magic Oscillating ..... 20%  
 Rubber, per doz., \$10.00 ..... 25%

**Compasses, Dividers &c.**

Compasses, Callipers, Dividers, 70¢10%75%  
 Bents & Call Co.'s .....  
 Dividers .....  
 Callipers, Call's Patent Inside ..... 55%  
 Callipers, Double ..... 55%  
 Callipers, Inside or Outside ..... 55%  
 Callipers, Wing ..... 55%  
 Compasses ..... 50¢25%  
 Excelsior ..... 50%

**Combination Dividers**

Combination Dividers ..... 25%  
 Lock Callipers and Dividers ..... 25%  
 Spring Callipers and Dividers ..... 25%10%  
 Stevens & Co.'s ..... 25%10%

**Coolers, Water—**

S. S. & Co.: 2 gal., \$3.40; 3 gal., \$4.00;  
 4 gal., \$4.50; 5 gal., \$5.00 each ..... 00%

**Coopers Tools—**

See Tools, Coopers.

**Cord—**

Braded, Crown Drab and Fancy, 7/8  
 3/4 ..... 30%  
 Braded, Crown White, 7/8 ..... 60%  
 Cable Laid Italian Sash, 7/8 ..... 10%  
 Common ..... 8%40%  
 Common Russia Sash, 7/8 ..... 12%18%  
 Egyptian, India Hemp, Braded, 7/8 ..... 20%  
 India Cable Laid Sash, 7/8 ..... 11%12%  
 Massachusetts, White, 7/8 ..... 22%24%  
 Cassava Mills—  
 Crown, Solid Braded White, 7/8 ..... 20%  
 Crown, Drab and Fancy, 7/8 ..... 22%  
 Braded, Giant, Drab and Fancy, 7/8 ..... 30%  
 Braded, Giant, White, 7/8 ..... 20%  
 Patent, good quality, 7/8 ..... 10%11%  
 Patent Russia Sash, 7/8 ..... 13%14%  
 Braded, Drab Cotton, 7/8 ..... 42%  
 Braded, Italian Hemp, 7/8 ..... 40%  
 Braded, Linen, 7/8 ..... 50%  
 Braded, White Cotton, 7/8 ..... 87%  
 Semper Idem, Braded, White, 7/8 ..... 20%

**Crown, Solid Braded White, 7/8**

3/4 ..... 30%

**Crown, Drab and Fancy, 7/8**

3/4 ..... 22%

**Braded, Giant, Drab and Fancy, 7/8**

3/4 ..... 30%

**Braded, Giant, White, 7/8**

3/4 ..... 20%

**Patent, good quality, 7/8**

3/4 ..... 10%11%

**Patent Russia Sash, 7/8**

3/4 ..... 13%14%

**Braded, Drab Cotton, 7/8**

3/4 ..... 42%

**Braded, Italian Hemp, 7/8**

3/4 ..... 40%

**Braded, Linen, 7/8**

3/4 ..... 50%

**Braded, White Cotton, 7/8**

3/4 ..... 87%

**Semper Idem, Braded, White, 7/8**

3/4 ..... 20%

**Silver Lake**

A quality, Drab, 5/8 ..... 25%  
 A quality, White, 5/8 ..... 25%  
 B quality, Drab, 5/8 ..... 10%  
 B quality, White, 5/8 ..... 10%  
 Sylvan Spring, Extra Braded, Drab, 5/8 ..... 39%  
 Sylvan Spring, Extra Braded, White, 5/8 ..... 39%

**Tate's Solid Braded—**

Economy Drab ..... 20%  
 Economy, White ..... 20%  
 Hercules, Drab ..... 30%  
 Hercules, White ..... 30%  
 White Cotton Braded, fair ..... 20%24%

**Wire Picture—**

Braded or Twisted ..... 80¢10¢80¢20%

**Corkscrews—See Screws, Cork.****Cork Knives and Cutters**

See Knives, Cork.

**Crackers, Nut—**

Acme .....  
 Japanned, 7/8 gro., \$30 ..... 50%  
 Nickel Plated, 7/8 gro., \$30 ..... 10%  
 Table (H. & B. Mfg. Co.) ..... 40%  
 Turner & Seymour Mfg. Co. .... 50%

**Cradles**

Grain ..... 50¢2¢50¢5¢5%

**Crays—**

White Crays, 7/8 gro., ..... 60¢6%  
 Cases, 100 gr., \$3.75 to \$4.25, at factory.  
 D. M. Steward Mfg. Co. ....  
 Metal Workers', 7/8 gro., \$2.50, 20¢25%  
 Railroad, 7/8 gro., \$2.50, 20¢25%  
 Rolling Mill, 7/8 gro., \$2.50, 20¢25%  
 Soapstone Pencils, 7/8 gro., \$1.50, 20¢25%  
 See also Chalk

**Creamery Pails—See Pails, Creamery****Crow Bars—See Bars, Crow****Curry Combs—**

See Combs, Curry.

**Cutters—Meat—**

American ..... 30%  
 Nos. 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100  
 Each ..... \$5 \$7 \$10 \$12 \$15 \$18 \$20 \$25 \$30 \$35 \$40 \$45 \$50 \$55 \$60 \$65 \$70 \$75 \$80 \$85 \$90 \$95 \$100  
 Enterprise ..... 10 12 15 18 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100  
 Nos. 10 12 15 18 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100  
 Diron's, 7/8 doz. ..... 40¢40¢25%  
 Nos. 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100  
 Nos. 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100  
 Nos. 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100  
 Nos. 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100  
 Nos. 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100  
 Nos. 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100  
 Nos. 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100  
 Nos. 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100  
 Nos. 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100  
 Nos. 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100  
 Nos. 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100  
 Nos. 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100  
 Nos. 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100  
 Nos. 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100  
 Nos. 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100  
 Nos. 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100  
 Nos. 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100  
 Nos. 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100  
 Nos. 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100  
 Nos. 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100  
 Nos. 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

**Halters—**

Covert's Adj. Rope Halters.....40x25  
Covert's Adj. W. Halters.....55x25x25  
Covert's Jump Horse and Cattle Tie.....50x10x25  
Covert's Jute Cattle Ties.....70x10x25  
Covert's Jute Horse Ties.....70x10x25  
Covert's Rope, 1-16 in. Jute.....70x10x25  
Covert's Rope, 3-16 in. Hemp.....50x25x25  
Covert's Rope.....50x10x10x25  
Covert's Saddlery Works Halters.....38x25  
Covert's Saddlery Works Handy Web Halters.....38x25  
Covert's Saddlery Works Horse and Cattle Ties.....38x25

**Hammers—****Handled Hammers—**

Atta Tool Co.....50x10x60x  
Buffalo Hammer Co.....50x10x60x  
Humason & Beckley.....50x10x60x  
Verree.....50x10x60x  
Cheney's Claw.....40x10x25  
Cheney's Machinists' & Riveting.....40x10x25  
C. Hammond & Son.....40x10x25  
Magnetic Tack, Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000

**Heavy Hammers and Sledges—**

5 lb and under.....40x40x10x  
5 to 6 lb.....80x80x10x  
Over 6 lb.....100x100x10x  
Wilkinson's Sledge.....100x100x10x

**Handcuffs and Leg Irons—**

See Police Goods.

**Handies—****Cross-Cut Saw Handles—**

Atkins.....40x  
Champion.....40x  
Fly's Perfection.....40x  
Sensible.....40x  
Barn Door.....20x8x5  
Bronze Iron Drop Latches.....40x8x5  
Chest, Sargent's List.....50x10x60x10x10x  
Door or Thumb.....0 1 2 3 4  
Per doz.....\$0.90 1.00 1.08 1.35 1.50  
Jap'd Store Door Handles.....Nuts, 1 lb, 2 lb, 3 lb, 4 lb, 5 lb, 6 lb, 7 lb, 8 lb, 9 lb, 10 lb, 11 lb, 12 lb, 13 lb, 14 lb, 15 lb, 16 lb, 17 lb, 18 lb, 19 lb, 20 lb, 21 lb, 22 lb, 23 lb, 24 lb, 25 lb, 26 lb, 27 lb, 28 lb, 29 lb, 30 lb, 31 lb, 32 lb, 33 lb, 34 lb, 35 lb, 36 lb, 37 lb, 38 lb, 39 lb, 40 lb, 41 lb, 42 lb, 43 lb, 44 lb, 45 lb, 46 lb, 47 lb, 48 lb, 49 lb, 50 lb, 51 lb, 52 lb, 53 lb, 54 lb, 55 lb, 56 lb, 57 lb, 58 lb, 59 lb, 60 lb, 61 lb, 62 lb, 63 lb, 64 lb, 65 lb, 66 lb, 67 lb, 68 lb, 69 lb, 70 lb, 71 lb, 72 lb, 73 lb, 74 lb, 75 lb, 76 lb, 77 lb, 78 lb, 79 lb, 80 lb, 81 lb, 82 lb, 83 lb, 84 lb, 85 lb, 86 lb, 87 lb, 88 lb, 89 lb, 90 lb, 91 lb, 92 lb, 93 lb, 94 lb, 95 lb, 96 lb, 97 lb, 98 lb, 99 lb, 100 lb

**Wood—**

Auger, assorted.....gr 5.00  
Auger, large.....gr 7.00  
File, assorted.....gr 2.75  
Brad Axl.....gr 2.00  
Apple Firmer Chisel, ass'd.....gr 5.00  
Apple Firmer Chisel, large.....gr 6.00  
Pickory Firmer Chisel, ass'd.....gr 4.50  
Hickory Firmer Chisel, large.....gr 5.00  
Socket Firmer Chisel, ass'd.....gr 3.00  
Socket Framing Chisel, ass'd.....gr 3.00  
Chisel, Fibre Head.....30x25  
Hammer, Hatchet, Axe, &c.....40x40x25  
Hoe, Rake, Shovel, &c.....60x40x25  
Pat. Auger, Double.....gr 1.25  
Pat. Auger, Ives.....gr 1.00  
Pat. Auger, Swan's.....gr 1.00  
Saw and Plane.....40x10x60x  
J. B. Smith & Co.'s Pat. File.....50x

**Hangers—**

Barn Door, New England.....70x70x5  
Barn Door, old patterns.....70x70x5  
Barry.....50x  
Best Anti-Friction.....60x10x60x10x5  
Boss.....40x10x60x10x5  
Carrier Steel Anti-Friction.....50x25  
Champion.....60x10x60x10x5  
Chicago Anti-Friction.....80x10x60x10x5  
Climax Anti-Friction.....55x  
Cincinnati Nos. 1, 2, 25, 3, 32, 50, 4, 52, 50  
Crescent.....60x60x10x60x10x  
Cronk's Patent Steel Covered.....60x10x60x10x5  
Duplex (Wood Track).....60x10x60x10x5  
Economy, 36, 00.....60x10x60x10x5  
Hamilton Wrought Steel Track.....55x  
Interstate.....50x10x60x10x5  
Kidder's.....50x10x60x10x5  
Lane's New Standard.....40x10x60x10x5  
Lane's Parlor.....40x10x60x10x5  
Lane's Standard.....50x10x60x10x5  
Lundy Steel Parlor.....40x  
Magic.....45x10x60x10x5  
Matchless.....50x10x60x10x5  
Moody.....45x  
Moore's Baggage Car Door.....38x25  
Moore's Elevator.....38x25  
Moore's Railroad.....38x25  
Nickel Steel, Nos. 0, 25, 1, 32, 2, 51, 40x10x60x10x5  
Orleans Steel.....55x  
Paragon Nos. 5, 6, 7 and 8.....20x10x60x10x5  
Pendulum Payson's.....40x10x60x10x5  
Perfection.....50x10x60x10x5  
Richards.....30x30x10x60x10x5  
Samson Steel Anti-Friction.....55x  
Star.....40x10x60x10x5  
Stearns' Anti-Friction.....20x10x60x10x5  
Stearns' Challenge.....25x10x60x10x5  
Sterling.....50x10x60x10x5  
Terry's Ideal.....50x10x60x10x5  
Terry's Modern.....50x10x60x10x5  
Terry's Shield.....50x10x60x10x5  
Terry's Wrought Single Strap.....50x10x60x10x5  
Victor, No. 1, 16, 00, No. 2, 16, 00, No. 3, 18, 00, No. 4, 18, 00, No. 5, 18, 00, No. 6, 18, 00, No. 7, 18, 00, No. 8, 18, 00, No. 9, 18, 00, No. 10, 18, 00, No. 11, 18, 00, No. 12, 18, 00, No. 13, 18, 00, No. 14, 18, 00, No. 15, 18, 00, No. 16, 18, 00, No. 17, 18, 00, No. 18, 18, 00, No. 19, 18, 00, No. 20, 18, 00, No. 21, 18, 00, No. 22, 18, 00, No. 23, 18, 00, No. 24, 18, 00, No. 25, 18, 00, No. 26, 18, 00, No. 27, 18, 00, No. 28, 18, 00, No. 29, 18, 00, No. 30, 18, 00, No. 31, 18, 00, No. 32, 18, 00, No. 33, 18, 00, No. 34, 18, 00, No. 35, 18, 00, No. 36, 18, 00, No. 37, 18, 00, No. 38, 18, 00, No. 39, 18, 00, No. 40, 18, 00, No. 41, 18, 00, No. 42, 18, 00, No. 43, 18, 00, No. 44, 18, 00, No. 45, 18, 00, No. 46, 18, 00, No. 47, 18, 00, No. 48, 18, 00, No. 49, 18, 00, No. 50, 18, 00, No. 51, 18, 00, No. 52, 18, 00, No. 53, 18, 00, No. 54, 18, 00, No. 55, 18, 00, No. 56, 18, 00, No. 57, 18, 00, No. 58, 18, 00, No. 59, 18, 00, No. 60, 18, 00, No. 61, 18, 00, No. 62, 18, 00, No. 63, 18, 00, No. 64, 18, 00, No. 65, 18, 00, No. 66, 18, 00, No. 67, 18, 00, No. 68, 18, 00, No. 69, 18, 00, No. 70, 18, 00, No. 71, 18, 00, No. 72, 18, 00, No. 73, 18, 00, No. 74, 18, 00, No. 75, 18, 00, No. 76, 18, 00, No. 77, 18, 00, No. 78, 18, 00, No. 79, 18, 00, No. 80, 18, 00, No. 81, 18, 00, No. 82, 18, 00, No. 83, 18, 00, No. 84, 18, 00, No. 85, 18, 00, No. 86, 18, 00, No. 87, 18, 00, No. 88, 18, 00, No. 89, 18, 00, No. 90, 18, 00, No. 91, 18, 00, No. 92, 18, 00, No. 93, 18, 00, No. 94, 18, 00, No. 95, 18, 00, No. 96, 18, 00, No. 97, 18, 00, No. 98, 18, 00, No. 99, 18, 00, No. 100, 18, 00

**Harness Snaps—See Snaps.****Hatchets**

American Axe and Tool Co.....40 x 10  
Blood's.....50x  
Hunt's.....50x  
Hurd's.....50x  
Mann's.....50x  
Underhill's.....50x  
C. Hammond & Son.....10x  
Fayette R. Plumb.....10x  
Collins.....10x  
Buffalo Hammer Co.....10x  
Kelly's.....50 x 50  
P. S. & W. Co.....50 x 50  
Sargent's & Co.....50x  
O. White, Lohr & Co.....50x  
Ten Eyck Edge Tool Co.....50x

**Hay and Straw Knives**

See Knives.

**Hinges—****Blind Hinges—**

Clark's  
Nos. 1, 3, 5, 1868, Old Pattern.....75x10x5x  
Nos. 1 and 3, Tip Pattern.....75x10x5x  
No. 50 Buffalo Noiseless, 40, 60, 80, 100, 120, 140, 160, 180, 200, 220, 240, 260, 280, 300, 320, 340, 360, 380, 400, 420, 440, 460, 480, 500, 520, 540, 560, 580, 600, 620, 640, 660, 680, 700, 720, 740, 760, 780, 800, 820, 840, 860, 880, 900, 920, 940, 960, 980, 1000  
No. 1, Cottage, for wood only.....80x10x5x  
No. 1, Diamond, for wood only.....80x10x5x  
Dixie L. & P. Nos. 3, 2 1/2, 2 1/4, 1, 0, 00, 4 and 5.....75x10x5x  
No. 25 Empire Reversible.....75x10x5x  
Lull & Porter, Nos. 3, 2 1/2, 2 1/4, 1, 0, 00, 4 and 5.....75x10x5x  
Mortise Gravity, Nos. 2, 4, 4 1/2, 6, 8, 9 and 10.....50x50x10x  
Butler.....50x50x10x  
Parker.....75x10x5x  
North's Automatic Blind Fittings, No. 2, for Wood, \$9.00, No. 3, for Brick, \$11.50  
Reading's Gravity.....75x10x5x  
Sargent's Nos. 1, 3, 5, 11, 12, 13.....75x10x5x  
Shepard's  
Acme, Lull & Porter, Nos. 3, 2 1/2, 2 1/4, 1, 0, 00, 4 and 5.....75x10x5x  
Buffalo Gravity Locking, Nos. 1, 3 and 5.....80x10x5x  
Champion Gravity Locking, No. 75.....80x10x5x  
Clark's or Shepard's 1868, Old Pattern, Nos. 1, 3 and 5.....75x10x5x  
Clark's or Shepard's Tip Pattern, Nos. 1, 3 and 5.....75x10x5x  
Double Locking, Nos. 20 and 25.....75x10x5x  
Empire, Nos. 101 and 103.....75x10x5x  
Niagara Gravity Locking, Nos. 1, 3 and 5.....80x10x5x  
Noiseless, Nos. 50, 60, 65 and 55.....75x10x5x  
O. S. Lull & Porter, Nos. 3, 2 1/2, 2 1/4, 1, 0, 00, 4 and 5.....75x10x5x  
Pioneer, Nos. 080, 45 and 54.....75x10x5x  
Steamboat Gravity Locking No. 10.....80x10x5x

**Gate Hinges—**

Automatic.....\$12.50, 50x  
Clark's, Nos. 1, 2, 3.....60x10x60x10x5x  
N. E.....\$7.80, 60x10x60x10x5x  
N. E. Reversible.....\$5.60, 60x10x60x10x5x  
N. Y. State.....\$4.90, 60x10x60x10x5x  
Shepard's Nos. 1, 2, 3.....60x10x60x10x5x  
Western.....\$4.20, 60x10x60x10x5x

**Spring Hinges—**

Acme.....30x  
American.....20x  
Bardley's Patent Checking.....15x  
Barker's Double Acting.....25x  
Bommer's Japanned.....35x  
Bommer's All other Kinds.....30x  
Bommer's.....15x  
Champion.....60x  
Chicago.....\$10.00  
Columbia.....\$10.00  
Crown.....20x  
Devore, No. 1.....\$13.00  
Freeport.....\$12.00  
Gerson's Spring and Blank Butts.....20x  
Gem.....20x  
Ideal No. 3.....\$12.00  
J. G. C Covered, gr. 330.....\$6.25  
Knoxall.....\$12.00  
New Idea No. 1.....\$10.00  
New Idea No. 2.....\$15.00  
New Idea Dbl. Acting.....\$15.00  
No. 10 Matchless.....60x  
No. 25 Unbreakable.....60x  
Oxford.....20x  
Reliable.....60x  
Rex.....\$13.00  
Royal.....\$10.00  
Searns' Noiseless Floor Hinge.....\$6.00  
Surprise.....\$12.00  
Union Mfg. Co.....25x  
Union Spring Hinge Co.'s List, March, 1894.....20x  
Wiles, No. 1, gr. 116; No. 2, 113.....20x

**Wrought Iron Hinges—**

Corrug'd Strap and T.....60x10x10x  
Strap and T List May 22, 1894.....60x10x10x  
Plate Hinges, 8, 10 & 12 in.....5x  
"Providence" over 12 in.....4x  
Rolled Blind Hinges, Nos. 32 and 34.....50x10x  
Rolled Blind Hinges, Nos. 232 and 234.....55x10x  
Rolled Plate.....70x10x  
Rolled Raised.....70x10x  
Screw Hook and Eye.....4 in. 75x  
Screw Hook and Eye.....6 to 12 in. 54x  
Strap.....14 to 20 in. 34x  
Strap.....22 to 36 in. 24x

**Hoes—**

Scovill and Oval Pattern.....50x10x60x10x  
D. & H. Scovill.....20x80x  
Grub.....40x10x60x10x  
Lane's Crescent Planter Pattern.....45x25x  
Lane's Razor Blade, Scovill Pat.....30x5x

**Handled—**

Garden, Mortar, &c.....70x70x5x2x  
Magic.....\$4.00  
Planter's Cotton, &c.....70x70x5x2x  
Warren Hoe.....60x80x5x

**Hog Rings and Rings—**

See Rings and Rings.

**Holisting Apparatus—**

See Machines, Holisting.

**Hollow-Ware—**

See Ware, Hollow.

**Holders—**

Sensible Bag and Twine.....50x  
Springle's Pat.....\$12.00, 60x

**Bit—**

Angular.....\$24.00,

**Plate.**..... 45¢  
**Barnes's Night Latch.**..... 15¢  
**B. & E. Mfg. Co., list Mar. 80, 1889.**..... 60¢10¢70¢  
**Sargent & Co., list July, 1894.**..... 60¢10¢70¢  
**Warner's Burglar Proof.**..... 60¢10¢70¢

### Elevator—

**Moore's**..... 83¢4¢

### Padlocks—

**Wrought Iron Padlocks:**  
**Brittan, Graham & Mathes, list**  
**Jan., 1894.**..... 75¢  
**Mallory, Wheeler Co., list Jan. 1,**  
**1894.**..... 75¢  
**Norwich Lock Mfg. Co., list June**  
**10, 1891.**..... 50¢2¢  
**Russell & Erwin Mfg. Co., list June**  
**10, 1891.**..... 50¢2¢  
**Sargent & Co., list January 1, 1894.**  
**75¢**  
**William Wilcox Mfg. Co., list Janu-**  
**ary 1, 1894.**..... 75¢20¢  
**Ames Sword Co. up to No. 103 inclu.**..... 50¢  
**Ames Sword Co. above No. 103.**..... 50¢10¢  
**Barnes Mfg. Co.**..... 40¢  
**Champion Padlocks.**..... 40¢  
**A. E. Dells.**..... 40¢  
**Eagle.**..... 40¢  
**Eureka, Eagle Lock Co.**..... 40¢2¢  
**M. T. Fratt's Keystone Scandinavian**  
**1010 line.**..... 90¢30¢  
**120 line.**..... 85¢  
**109 line.**..... 70¢10¢  
**519 line.**..... 70¢10¢  
**225, 610 and 209 lines.**..... 70¢  
**All other numbers.**..... 50¢5¢  
**Horseshoe.**..... 50¢5¢  
**Hotchkiss.**..... 50¢5¢  
**Koch's.**..... 30¢  
**Bomer's Nos. 0 to 91.**..... 30¢  
**Bomer's Scandinavian, &c., Nos. 100 to**  
**505.**..... 15¢  
**Scandinavian.**..... 90¢50¢  
**Maymaker, Barry & Co.**..... 90¢  
**No. 1010 line.**..... 50¢  
**No. 41 line.**..... 50¢  
**No. 61 line.**..... 60¢  
**No. 21 line.**..... 70¢  
**No. 109 line.**..... 90¢40¢  
**Star.**..... 60¢  
**Yale Lock Mfg. Co.'s.**..... net prices

### Sash, &c.—

**Attwell Mfg. Co.**..... 25¢33¢4¢  
**Champion Safety list January, 1893.**..... 70¢5¢  
**Clark's No. 1, 510; No. 2, 53¢ gr.**..... 33¢4¢  
**Common Sense, Jap'd, Cop'd and**  
**Br'ed.**..... gr \$4.00  
**Common Sense, Nickel Plated.**  
**Corbin's Daisy, list Feb. 15, 1889.**..... gr \$10.00  
**Davis Bronze, Barnes Mfg. Co.**..... 70¢  
**Ferguson's.**..... 33¢4¢  
**Fish (Liesche's pat.), No. 100, gr.**..... 4¢  
**No. 105, gr.**..... \$10.  
**Giant, list Jan. 1892.**..... 70¢10¢  
**Hammond's Window Springs.**..... 40¢  
**Huginlin's New Sash Locks.**..... 25¢5¢2¢  
**Huginlin's Sash Locks.**..... 25¢5¢2¢  
**Ives' Patent.**..... 60¢10¢2¢60¢10¢10¢  
**Kempshall's Gravity.**..... 60¢  
**Kempshall's Model.**..... 60¢60¢10¢  
**Monarch.**..... 60¢10¢10¢  
**Payson's Perfect.**..... 60¢10¢10¢  
**Reading.**..... 60¢10¢10¢60¢10¢10¢  
**Security.**..... 70¢  
**Universal.**..... 80¢  
**Victor.**..... 60¢10¢2¢  
**Walker's.**..... 10¢  
**Wolcott's.**..... 60¢10¢2¢

### Lumber Tools—

**See Tools, Lumber.**  
**Lustro—**  
**Four-ounce bottles.**..... gr dos, \$1.75; gr  
**gross.**..... \$17.00

### Machines.

**Boring—**  
**Without**  
**Angers, Upright, Angular.**  
**Boss, Carpenters' 3.80**  
**Boss, Ship Bldrs' 3.85**  
**Douglas.**..... \$5.50 \$6.75..... 50¢  
**Jennings' 5.50 6.75..... 50¢50¢2¢**  
**Millers Falls 7.50..... 25¢**  
**Phillips' Patent**  
**with Anger.**..... 7.00 7.50.....  
**Snell's, Rice's Pat 5.50 6.75..... 40¢10¢10¢**

### Fluting—

**American, 5 in., \$3.00; 6 in., \$3.40; 7 in.,**  
**\$4.50 each.**..... 35¢  
**Combined Fluter and Sash Iron.**  
**Crown, 4 1/2 in., \$3.50; 6 in., \$4.00; 8 in.,**  
**\$5.50 each.**..... 35¢  
**Crown Hand Fluter, No. 1, \$15.00; 2,**  
**\$12.50; 3, \$10.00; 4, \$8.25..... 30¢**  
**Crown Jewel, 6 in., \$3.50 each, 35¢**  
**Domestic Fluter..... each, \$1.50**  
**Eagle, 8 1/2-inch Rolls, \$2.15..... 35¢**  
**Eagle, 5 1/2-inch Rolls, \$2.85..... 35¢**  
**Kn xx, 4 1/2-inch Rolls, \$3.25 each } 35¢**  
**Kn xx, 6-inch Rolls, \$3.60 each }**

### Holting—

**Moore's Anti-Friction Differential Pul-**  
**ley Block.**..... 20¢  
**Moore's Hand Hoist, with Lock Brake.**..... 20¢  
**Moore's Rope Differential Pulley**  
**Block**  
**Marris & Beekley (Teal Patent)..... 30¢**  
**See also Blocks.**

### Washing—

**Fair and Square.**..... gr dos \$42.00  
**Anthony Wayne, gr dos, No. 1, \$42; No.**  
**2, \$36; No. 3, \$42.**  
**Wayne American.**..... gr dos \$36.00  
**Wells.**..... gr dos \$42.00  
**Western Star gr dos, No. 2, \$36 No. 3**  
**\$36**

### Mallets—

**B. & L. Block Co., Hickory & L. V.**  
**80¢10¢40¢**  
**Vibre Head, Stearns.**..... 39¢4¢  
**Hickory.**..... 80¢10¢50¢10¢10¢  
**Lignumvite.**..... 80¢10¢50¢10¢10¢

### Mattocks—Regular List.

**Measures—**  
**Standard Fireware, No. 1, peck gr**  
**down, \$3.50; 1/2-peck, \$3.00**

### Meat Cutters—

**Cutters, Meat**

### Menders—

**Harness**..... gr doz, \$1.75  
**Hudson's Hose Menders, in set, gr doz,**  
**\$3.00**  
**Hudson's Hose Bands.**..... gr, \$1.25

### Milk Cans—See Cons. Milk.

### Mills—

**Box and Side, list Jan. 1, 1888.**..... 60¢10¢  
**Net prices are often made which are**  
**lower than above discount.**  
**American, Enterprise Mfg. Co., list Jan.**  
**17, 1893.**..... 80¢  
**National List, Jan. 1, 1894.**..... 80¢  
**Swift, Lane Bros**  
**Waddell's New Box Mills, Ideal**  
**Brand, New List.**..... 60¢60¢10¢

### Mining Knives—

**See Knives, Mining.**  
**Molasses Gates—**  
**See Gates, Molasses.**

### Money Drawers—

**See Drawers, Money.**

### Mowers, Lawn—

**Highest 10 in. 12 in. 14 in.**  
**grade. \$4.00 to \$5.25 \$4.50 to \$6.00 \$5.00 to \$6.75**  
**Good \$3.00 \$3.25 \$3.50**  
**Cheap 2.25 2.50 2.75**

### Muzzles—

**Safety.**..... gr dos, \$3.00, 25¢

### Nails—

**Cut and Wire. See Trade Report.**  
**Wire Nails, Pepered.**  
**Association list, May 1, '92.**..... 85¢10¢5¢

### Hungarian, Finishing, Upholsterers', &c.

**See Tacks.**

### Horse—

**A. C. Nos. 6 9 10**  
**25¢ 23¢ 22¢ 21¢ 21¢**  
**American.**..... 9¢ 9¢ 9¢ 9¢ 9¢ net  
**Anchor.**..... 28¢ 21¢ 20¢ 19¢ 18¢ 35¢  
**Ausable.**..... 28¢ 26¢ 24¢ 23¢

**Capewell.**..... 19¢ 18¢ 17¢ 16¢ 15¢ 10¢5¢2¢  
**C. B. K.**..... 25¢ 23¢ 22¢ 21¢ 21¢ 40¢  
**Champion.**..... 25¢ 23¢ 22¢ 21¢ 20¢ 10¢10¢10¢

**Champlain.**..... 28¢ 26¢ 25¢ 24¢ 23¢  
**Clinton, Fin.**..... 19¢ 17¢ 16¢ 15¢ 14¢ 30¢5¢  
**Empire Bronzed.**..... 11¢11¢4¢  
**Essex.**..... 28¢ 26¢ 25¢ 24¢ 23¢

**Lyra.**..... 9¢ 9¢ 9¢ 9¢ 9¢ net  
**Maud S.**..... 25¢ 23¢ 22¢ 21¢ 21¢ 10¢10¢5¢

**Northwest'n.**..... 25¢ 23¢ 22¢ 21¢ 20¢ 25¢5¢5¢  
**Putnam.**..... 23¢ 21¢ 20¢ 19¢ 18¢ 15¢  
**Snowden.**..... 9¢ 9¢ 9¢ 9¢ 9¢ net  
**Standard.**..... 23¢ 21¢ 20¢ 19¢ 18¢ 35¢  
**Vulcan.**..... 23¢ 21¢ 20¢ 19¢ 18¢ 25¢  
**Western.**..... 21¢ 20¢ 19¢ 18¢ 15¢ 50¢

### Picture—

**Brass Head, Combination list.**..... 50¢10¢  
**Brass Head, Sargent's list.**..... 60¢60¢10¢  
**Porcelain Head, Combination list.**..... 40¢10¢  
**Porcelain Head, Sargent's list.**..... 50¢10¢10¢  
**Niles' Patent.**..... 40¢

**Nail Pullers—See Pullers, Nail.**  
**Nail Sets—See Sets, Nail**  
**Nippers—See Pliers and Nippers**  
**Nut Crackers—**  
**See Crackers, Nut.**

### Nuts—List Dec. 18, 1889.

**Cold Punched.**..... Square, Hex.  
**Hot Pressed.**..... 5.00¢ 6.10¢ off list  
**In packages of 100 lb, add 1-10¢ lb, add**  
**net; in packages less than 100 lb, add**  
**1/2¢ lb, net.**

### Oakum—

**Best or Government.**..... gr 6¢4¢6¢4¢  
**Navy.**..... gr 4¢4¢4¢4¢  
**U.S. Navy.**..... gr 5¢4¢5¢4¢

### Oil Tanks—See Tanks, Oil.

### Oilers—

**Brass and Copper.**..... 50¢10¢50¢10¢5¢  
**Zinc and Tin.**..... 70¢70¢10¢  
**Broughton's Brass.**..... 50¢  
**Broughton's Zinc.**..... 60¢  
**Malleable, Hammers' Improved, No. 1,**  
**\$3.80; No. 2, \$4.00; No. 3, \$4.40 gr dos.**  
**10¢5¢**

**Malleable, Hammers' Old Pattern, same**  
**list.**..... 50¢  
**Olstead's Brass and Copper.**..... 50¢  
**Olstead's Tin and Zinc.**..... 60¢  
**Prior's Pat. or "Paragon" Brass.**..... 70¢  
**Prior's Pat. or "Paragon" Zinc.**..... 70¢  
**Steel, Draper & Williams.**..... 50¢  
**Wilmot & Hobbs Mfg. Co., Steel Anti-**  
**Rust.**..... 60¢

### Openers, Can—

**American.**..... gr gross \$1.75 to \$2.00  
**Champion.**..... gr dos \$2.00..... 50¢  
**Domestic.**..... gr dos \$2.00..... 50¢  
**Duplex.**..... gr dos \$2.50..... 55¢  
**Eureka.**..... gr dos \$2.50..... 50¢  
**Excelsior, No. 1 \$2.50; No. 2, \$1.50..... 40¢**  
**French, No. 4.**..... gr dos \$2.25, 55¢60¢  
**Iron Handle, No. 5.**..... gr gr \$2.00, 45¢60¢  
**Lyman's.**..... gr dos \$3.75, 20¢  
**Messenger's Comet.**..... gr dos \$3.00, 25¢  
**Moore's.**..... 70¢  
**Sardine Scissors.**..... gr dos \$2.75 to \$3.00  
**Sprague, No. 1, 55¢; 2, 60¢; 3, 65¢.**  
**Star.**..... gr dos \$2.75

**Streeter's:**  
**Sensible, Japanned, per doz.**..... 60¢  
**Stiegle, Nickel, per doz.**..... 75¢  
**Surprise, per doz.**..... 75¢  
**Feinor's Pat. or "Paragon" H'dle, per doz.**..... 50¢  
**New Sprague, Metal H'dle, per doz.**..... 60¢  
**New Sprague, Wood H'dle, per doz.**..... 60¢  
**Universal.**..... gr dos \$3.00..... 55¢5¢  
**World's Best gr gross, No. 1, \$12.00;**  
**No. 2, \$24.00; No. 3, \$26.00..... 50¢10¢**

**Packing, Steam—**  
**Rubber—**  
**Standard, fair quality.**..... 70¢10¢75¢  
**Interior quality.**..... 70¢10¢80¢  
**Extra.**..... 60¢85¢10¢85¢  
**Fleming's State.**..... 80¢..... 25¢25¢5¢  
**N. Y. B. & P. Co., Double Diamond.**..... 50¢  
**N. Y. B. & P. Co., Salamander.**..... 45¢  
**N. Y. B. & P. Co., Carbon.**..... 70¢5¢

### Miscellaneous—

**American Packing.**..... 9¢10¢4¢  
**Cotton Packing.**..... 14¢15¢4¢  
**Italian Packing.**..... 12¢15¢4¢  
**Tube.**..... 6¢7¢4¢  
**Russia Packing.**..... 15¢14¢4¢

### Pails—

**Creanery—**  
**S. S. & Co., 18 qt., \$7.00; 20 qt., \$7.25**  
**gr doz.**..... 5¢

### Galvanized Pails—

**Light.**..... 10 Quart..... \$2.00 to \$2.25 \$2.25 to \$2.50  
**Heavy.**..... 12 Quart..... 2.25 to 2.50 2.50 to 2.75  
**14 Quart..... 2.50 to 2.75 2.75 to 3.00**

### Galvanized Buckets—

**Fire.**..... 10 Quart..... \$2.50 to \$2.75 \$2.75 to \$3.00  
**Well.**..... 12 Quart..... 2.75 to 3.00 \$3.00 to \$3.25  
**14 Quart..... 3.00 to 3.25 3.25 to 3.50**

### Indurated Fiber Ware

**Fire Pails, deep.**..... gr dos \$4.80  
**Fire Pails, round bottom.**..... gr dos \$5.40  
**Milk, 14 qt.**..... gr dos \$5.40  
**Stable, 14 qt.**..... gr dos \$6.00  
**Star Pails, 12 qt.**..... gr dos \$4.20

### Standard Fiber Ware—

**Buggy Pails.**..... Plain. Deer'd  
**Chamber Pails, 14 qt.**..... \$3.00 \$7.00  
**Dairy Pails, 14 qt.**..... 3.75 4.25  
**Fire Pails, No. 1, 12 qt., gr dos 3.75**  
**Fire Pails, No. 2, 14 qt., gr dos 4.25**  
**Horse Pails.**..... 4.00  
**Slop Jars (bal. trap).**..... 7.50 8.50  
**Sugar Pails.**..... 4.75 5.25  
**Water Pails, 12 qt., gr dos 5.00 5.75**

### Pans—

**Dripping—**  
**Large sizes.**..... gr 5¢  
**Small sizes.**..... gr 5¢  
**Silver & Co. (Covered).**..... 40¢

### Fry—

**Standard List:**  
**No. 1..... 1 2 3 4**  
**gr dos \$3.00 \$3.75 \$4.25 4.75 \$5.25**  
**No. 2..... 5 6 7 8**  
**gr dos \$5.00 \$6.00 \$7.00 \$8.00 \$9.00**  
**Polished regular goods.**..... 75¢75¢10¢  
**Acme Fry Pans.**..... 65¢4¢

### Dust—

**Steel Edge, No. 1.**..... gr dos \$1.75

### Roasting and Baking—

**Columbian, S. S. & Co., Nos. 10, \$2; 20,**  
**\$2.25; 30, \$2.50 each.**..... 60¢10¢

### Paper and Cloth—

**Sand and Emery—**  
**List April 19, 1889.**..... 60¢10¢60¢  
**Sibley's Emery and Crocus Cloth.**..... 30¢

### Parers—

**Apple—**  
**Advance.**..... gr dos \$4.50  
**Baldwin.**..... gr dos 5.00  
**Bonanza.**..... each 5.00  
**Daisy.**..... gr dos 8.50  
**Imperial.**..... each 7.50  
**Belipsa.**..... gr dos 4.00  
**Eureka, 1888.**..... each 16.00  
**Family Bay State.**..... gr dos 12.00  
**Favorite.**..... gr dos 4.75  
**Gold Medal.**..... gr dos 4.00  
**Ideal.**..... gr dos 4.00  
**Little Star.**..... gr dos 27.00 to \$30.00  
**Monarch.**..... gr dos 13.50  
**New Lightning.**..... gr dos 5.50  
**Orion.**..... gr dos 4.00  
**Penn.**..... gr dos 3.00  
**Perfection.**..... gr dos 4.00  
**Reading 78.**..... gr dos 7.00  
**Rocking Table.**..... gr dos 5.50  
**Turn Table.**..... gr dos 4.50  
**Victor.**..... gr dos 13.50  
**Waverly.**..... gr dos 3.75  
**White Mountain.**..... gr dos 4.00

### Potato—

**Antrim Combination.**..... gr dos \$5.50  
**Saratoga.**..... gr dos \$5.50  
**White Mountain.**..... gr dos \$4.50

### Pencils, Soapstone—

**See Crayons.**

### Pickers, Fruit—

**Prize Fruit Pickers.**..... 50¢

### Picks—

**Railroad or Adze Eye, 5 to 6, \$12.00; 6**  
**to 7, \$13.00.**..... 60¢10¢10¢70¢

### Picture Nails—

**See Nails, Picture.**

### Pinking Irons—

**See Irons, Pinking.**

### Pins—

**Bow—**  
**Humason, Beckley & Co.'s.**..... 70¢70¢10¢  
**Fleck, Stow & W. Co.**..... 60¢60¢10¢  
**Sargent & Co.'s, \$17 and \$18.**..... 60¢10¢60¢10¢10¢

### Escutcheon—

**Brass.**..... 70¢  
**Iron, list Nov. 11, 1885.**..... 75¢

### Pipe, Wrought Iron—

**List April 13, 1893.**  
**1 1/2 and under, Plain.**..... 57 1/2¢10¢10¢10¢5¢  
**1 1/2 and under Galv.**..... 50¢10¢10¢10¢5¢  
**1 1/2 and over, Plain.**..... 67 1/2¢10¢10¢10¢5¢  
**1 1/2 and over, Galv.**..... 57 1/2¢10¢10¢10¢5¢  
**Boiler Tubes, list Oct. 24, 1892.**..... 55¢10¢10¢10¢5¢

**Casing, list Nov. 16, 1892.**..... 52 1/2¢10¢10¢10¢5¢  
**Cold Drawn Seamless Steel Tubing.**..... 50¢  
**Inserted Joints Casing, list Nov. 16,**  
**1892.**..... 47 1/2¢10¢10¢10¢5¢  
**Steel Boiler Tubes.**..... 27 1/2¢10¢10¢10¢5¢

### Planes and plane Irons—

**Wood Planes—**  
**Molding.**..... 50¢10¢  
**Bench, First quality.**..... 55¢10¢  
**Bench, Second quality.**..... 65¢10¢10¢  
**Bayley's (Stanley R. & L. Co.)**..... 60¢10¢

### Iron Planes—

**Bayley's (Stanley R. & L. Co.)**..... 50¢10¢  
**Birmingham Plane Co.**..... 60¢10¢60¢10¢10¢  
**Chaplin's Iron Planes.**..... 60¢10¢50¢10¢5¢  
**Davis' Iron Planes.**..... 50¢50¢5¢  
**Gage Tool Co.'s Self-Setting.**..... 55¢  
**Miscellaneous Planes (Stanley R. & L.**  
**Co.)**..... 25¢10¢  
**Sargent's.**..... 60¢60¢10¢  
**Standard Tool Co.**..... 50¢10¢10¢10¢10¢  
**Steele's Iron Planes.**..... 50¢10¢50¢10¢5¢

### Plane Irons—

**Abnurn Thistle.**..... 30¢10¢60¢10¢10¢  
**Buck Bros.**..... \$5.00 to \$5.25 to \$5.50  
**Butcher's.**..... \$5.00 to \$5.25 to \$5.50  
**Sandusky.**





**Snaps, Harness, &c.**  
Anchor 1. & S. Mfg. Co. 50c  
Andrews 50c  
Cover's Saddlery Works' Triumph 50c  
Covered Spring 60c  
Cover 50c  
Cover, New Patent 50c  
Cover, New R. E. 50c  
Hitch's (Cricket) 50c  
Herman, new list 50c  
Hotchkiss 10c  
Kelley & Woolworth's Steel Harness 50c  
John Prots Snaps 50c  
Sargent's Patent 50c  
70c & 10c & 15c & 20c & 25c

**Snaths**—See *Shears*.  
**Snips, Tinner's**—See *Shears*.  
**Soldering Irons**  
See *Iron, Soldering*.  
**Spittoons, Cuspidors, &c.**  
Standard Pipeware—  
Cuspidors, 3/4-inch, 7 doz., No. 5, 38; No. 6, 39.  
Spittoons, Daisies, 3-inch, No. 1, 10 and 11 inch, 25.  
**Spoke Shaves**—  
See *Shaves, Spoke*.  
**Spoke Trimmers**—  
See *Trimmers, Spoke*.  
**Spoons and Forks**—  
Tinned—  
Barting, Oliver, Co.'s list, 70c & 25c  
Buffalo, A. & S. Co. 35c & 25c  
Solid Table and Tea, Cen. Stamp. Co.'s list, 70c & 25c

**Silver Plated**—  
4 months or 55 cash 30 days:  
Boardman & Son 50c & 12c  
Holmes & Edwards Silver Co. 40c & 15c  
Hend & Barton 40c & 15c  
Rogers & Bros 40c & 15c  
O. Rogers & Bros 40c & 15c  
Rogers & Hamilton 40c & 15c  
Wm. Rogers Mfg. Co. 40c & 15c  
Simpson, Hall, Miller & Co. 40c & 15c

**Miscellaneous**  
Boardman's Britannia Spoons, case lots 60c & 25c cash  
Boardman's Nickel Silver, list July 1, 1891 60c & 25c  
Britannia 60c & 25c  
German Silver 60c & 25c  
Nickel Silver 60c & 25c  
Holmes & Edwards Silver Co.:  
No. 24 German Silver 50c & 10c  
No. 30 Silver Metal 50c & 10c  
No. 40 Nickel Silver 50c & 10c  
No. 50 Nickel Silver 50c & 10c  
No. 67 Mexican Silver 50c & 10c  
Rogers & Hamilton 40c & 15c  
Cimeter, Flatware 40c & 15c  
Cimeter, Steel Goods 40c & 15c  
Crown Hamilton, Flatware and Cutlery 40c & 15c  
Steel Goods 40c & 15c  
Wm. Rogers Mfg. Co.:  
135 Rogers' German Silver 60c & 25c  
225 Rogers' Nickel Silver 60c & 25c  
Rogers' Silver Metal 60c & 25c

**Springs—Door**  
Champion (Coll.) 55c & 10c & 55c & 10c & 55c  
Cowell's, No. 1, 7 doz. 18.00; No. 2, 15.00.  
Gem (Coll.), list April 19, 1886 50c & 10c  
Hercules 33c & 10c  
Phenix 33c & 10c  
Rubber, complete, 7 doz. 35.00; 8 doz. 40.00  
Star (Coll.), list April 19, 1886 50c & 10c  
Torrey's Rod, 39 in. 7 doz. 12.00; 1 doz. 1.50  
Warner's No. 1, 7 doz. 15.00; No. 2, 12.00  
Victor (Coll.) 60c & 10c & 60c & 10c  
**Carriage, Wagon, &c.**  
Mullipie, Concord, Platform and Half Scroll 60c & 10c & 60c & 10c & 60c & 10c  
Olin's Bolster Springs 25c  
**Sprinklers, Lawn**  
Gibbs' Arc 7 doz., 12.00  
Gibbs' Hustler 7 doz., 16.00  
**Squares**  
Nickel-Plated 85c & 25c  
Steel and Iron 85c & 25c  
Try Square and T Bevels 60c & 10c & 10c  
Avery's Bevel Protractor 60c  
Avery's Trench Bevel Square 40c  
Dixton's Try Square and T Bevels 50c  
Starrett's Micrometer Caliper Square 25c  
Winterbottom's Try and Miter 80c & 10c

**Squeezers**  
**Podder**  
Blair's 7 doz. 22.00  
Blair's "Olimax" 7 doz. 22.00  
**Lemon**  
Porcelain Lined, No. 1, 7 doz. 38.00  
Wood, Common 7 doz. 17.00; 35c  
Wood, No. 2 7 doz. 33.00; 75c  
Dean's, No. 1, 7 doz. 35.00; 2, 33.00; 3, 31.00; Queen, 25.00  
Dunlap's Improved 7 doz. 37.00; 20c  
Hotchkiss Straight Flash 7 doz. 12.00  
Jennings' Star 7 doz. 22.00  
King 40c  
Little Giant 50c & 10c  
Sammis, No. 1, 35.00; No. 2, 30.00; 15c  
18c 7 doz. 25.00  
The Boss 7 doz. 22.00  
**Standard Fiber Ware**  
See *Ware, Standard Fiber*.  
**Staples**  
Barbed Blind, 1/2 in. and larger, 7 doz. 75c  
Barbed Blind, 1/2 in. 7 doz. 85c  
Fence Staples, Galvanized, 1/2 in. 7 doz. 75c  
Fence Staples, Plain, 1/2 in. 7 doz. 75c  
Grand Crossing Tack Co.'s list 75c & 10c  
**Steels Butchers'**  
O. & A. Hoffmann's 40c  
Nichols Bros. 50c  
40c & 10c & 50c  
**Steelyards and Dies**  
Blacksmith's 85c  
Butterfield's Goods 85c  
Watford Goods 85c  
Gardner 25c  
Green River 50c  
Lightning Screw Plate 35c & 30c  
Reece's New Screw Plates 35c & 30c  
Reversible Ratchet 30c  
**Stone**  
**Stones, Grind—See Grindstones.**  
**Soythe Stones**  
Pike Mfg. Co., list April, 1892 35c  
Cleveland Stone Co., list Nov. 1892 35c

**Oil Stones, &c.**  
Pike Mfg. Co.:  
Hindstone No. 1, 7 doz. 35c  
Sand Stone 40c & 10c  
Turkey Oil Stone, 4 to 8 10c  
In 40c & 10c  
Lily White Washita 60c  
Roe's Red Washita 60c  
Washita Stone, Extra 60c  
Washita Stone, No. 1 60c  
Washita Stone, No. 2 60c  
Lily White Slips 60c  
Roe's Red Slips 60c  
Washita Slips, Extra 60c  
Washita Slips, No. 1 60c  
Arkansas Stone, No. 1, 3 to 5 in. 35c  
Arkansas Stone, No. 1 1/2 to 3 in. 35c  
Lake Superior Slips 60c & 10c  
Tanite Mills:  
Emery Oil 7 doz., 29.00; 50c & 65c  
**Stops, Bench**  
Cincinnati 25c & 10c  
Crescent 7 doz. 15.00  
McGills 7 doz. 15.00  
Millers Falls 35c  
Morrill's, 7 doz. No. 1, 10.00; No. 2, 11.00  
Stearns' 25c  
Tessell's Nos. 1 and 2, 7 doz., 35; No. 3, 35.00  
Weston's, W. I. 110, No. 2, 30.25 & 10c & 50c  
**Stove Polish**  
See *Polish, Stove*.  
**Stretchers Carpet**  
Cast Iron, Steel Points 7 doz. 75c & 80c  
Cast Steel, Polished 7 doz. 12.25  
Socket 35c & 10c  
Bullard's 35c & 10c  
**Strops, Razor**  
Bas & Bell and Co. 7 doz. 32.00  
Campbell Cutlery Co. Net prices  
Electric Cutlery Co. Net prices  
Genuine Emerson 60c & 10c  
Imitation 7 doz. 22.00, 20c & 10c & 50c  
Jordan's Pat. Padded, list No. 1, 32.00  
Lamont Combination 7 doz. 24.00  
Torrey's 7 doz. 24.00  
**Stuffer Sausage**  
Miles' Challenge, 7 doz. 22.00; 50c & 10c & 25c  
Perry 7 doz. No. 1, 15.00; No. 2, 12.00  
Draw Cut No. 4, each 30.00. 20c  
Enterprise Mfg. Co., list Jan. 17, 70c & 25c  
Silver's 40c & 10c  
**Sweepers, Carpet and Lawn Carpet**  
Aome 7 doz. 23.00  
Advance 7 doz. 18.00  
Banner Jap'd, 7 doz. 22.00; Nickel, 24.00  
Grand 7 doz. 27.00  
Gold Medal 7 doz. 27.00  
Suzer 7 doz. 27.00  
Cosmopolitan 7 doz. 27.00  
Furniture Protector, Jap. 7 doz. 24.00  
Furniture Protector, Nickel 7 doz. 27.00  
Inter Ocean 7 doz. 27.00  
Hall 7 doz. 24.00  
Crown Jewel, No. 1 15.00; No. 2, 20.00  
Domestic 7 doz. 21.00  
Domestic, No. 2 7 doz. 22.00  
Easy Jap'd, 7 doz. 22.00; Nickel, 24.00  
Excelior 7 doz. 22.00  
Garland 7 doz. 18.00  
Hilt Edge 7 doz. 22.00  
Grand Rapids 7 doz. 24.00  
Grand Republic 7 doz. 23.00  
Housewife's Delight 7 doz. 15.00  
Imperial 7 doz. 26.00  
Improved Parlor Queen 7 doz. 24.00  
Jannaped 7 doz. 27.00  
Nickel 7 doz. 27.00  
Ladies' Friend 7 doz. 15.00  
Ladies' Friend No. 2 7 doz. 18.00  
Model 7 doz. 27.00  
Parlor Queen 7 doz. 24.00  
Our Leader 7 doz. 19.00  
Our Own 7 doz. 27.00  
Royal Jap'd, 7 doz. 22.00; Nickel, 24.00  
Reliable 7 doz. 22.00  
Standard 7 doz. 24.00  
Supreme 7 doz. 22.00  
The Star 7 doz. 21.00  
Triumph 7 doz. 20.00  
Russell Carpet Sweeper Co. make the following rebates:  
1.00 per doz. in 5 doz. lots.  
2.00 per doz. in 10 doz. lots.  
Thompson Mfg. Co. 30c  
**Swings**  
Davies Lawn 25c  
**Tacks, Brads &c.**  
List October 19, 1889. Old established straight weights. Short weight goods are sold at lower prices.  
Carpet Tacks—  
American, Blued 47c & 10c  
American, Tin'd and Cop'd 52c & 10c  
Steel, Bright and Blued 52c & 10c  
Steel, Tinned and Coppered 52c & 10c  
Swedes Iron, S. S., Blued 40c  
Swedes Iron, S. S., Tinned 47c & 10c  
American Iron Tacks, Domestic 37c & 10c  
American Iron Tacks, Foreign 50c  
Swedes Iron Tacks—  
S. S., Blued 37c & 10c  
S. S., Tinned 45c  
Lanc. Blued 30c  
Lanc. Tinned 37c & 10c  
Upholsterers', S. S. 47c & 10c  
Upholsterers', Lanc. 37c & 10c  
Gimp Tacks—  
S. S., Blued 30c  
S. S., Tinned 42c & 10c  
Lanc. Blued 20c  
Lanc. Tinned 35c  
Basket and Trimmers' Tacks—  
Lanc. 20c  
Hungerford Nails 30c  
Common and Patent Brads 35c  
Leathered Tacks 5c  
Brush Tacks and Nails, S. S. 20c  
Looking Glass Tacks, S. S. 5c  
Picture-Frame Points, S. S. 12c & 10c  
Lace Tacks Blued 12c & 10c  
Lace Tacks Tinned 20c  
Finishing Nails 32c & 10c  
Trunk and Clout Nails—  
Black 52c & 10c  
Tinned or Coppered 57c & 10c  
Basket Nails 57c & 10c  
Chair Nails 50c  
Ogar Box Nails 50c  
Tin Copied Nails 50c

**Miscellaneous**  
Double Point 85c & 10c & 85c & 10c  
Wire Carpet Nails 60c & 10c & 60c & 10c  
Bill Nye Brad Box 40c  
Bonnie Hine 7 doz. 11.00  
Olive Middle Carpet 7 gross 24.00  
Home Tack, No. 50 7 case 12 car-tons, 85c. No. 100, 7 case 12 car-tons, 75c.  
Home Nails, No. 200, 7 case 12 car-tons, 85c. No. 400, 7 case 12 car-tons, 85c.  
Parisian Gilt Nails, cartoon 50c  
Plymouth Rock Carpet Tacks 30c  
Upholsterers' Nails 50c & 10c  
**Wire Brads and Nails**  
Steel-Wire Brads, R. & E. Mfg. Co.'s list 50c & 10c & 50c & 10c  
See also *Nails, Wire*.  
**Tanks Oil**  
Emerald, S. S. & Co.: 80-gal. 28.75; 60-gal. 21.11 each 50c & 10c & 50c & 10c  
**Tapes, Measuring**  
Chesterman's, Regular list 30c & 10c & 30c & 10c  
Excelior, Special list 30c  
Spring 40c  
**Thermometers**  
Tin Case 50c & 10c & 50c & 10c  
**Thimble Skeins—See Skeins.**  
**Ties Sale—Steel**  
Standard Wire, list 50c & 10c & 50c & 10c  
**Tinner's Shears, &c**  
See *Shears, Tinner's* &c.  
**Tinware**  
Stamped, Jannaped and Piced, list Jan. 20, 1887 70c & 10c & 70c & 10c  
**Tire Benders, Upsetters, &c.**—See *Benders and Upsetters*.  
**Tobacco Cutters**  
See *Cutters, Tobacco*.  
**Tools—Coopers'**  
Albertson Mfg. Co. 25c  
Barton's 30c & 10c & 30c & 10c  
Beatty's 33c & 10c  
Bradley's 20c  
Sandusky Tool Co. 30c & 10c & 30c & 10c  
Shaves Cincinnati Tool Co. 30c  
L. & J. White 20c & 10c  
**Lumber**  
Cant Hooks, "Blue Line" 7 doz. 16.00  
Cant Hooks, Common Finish 7 doz. 14.00  
Cant Hooks, Mail Socket Clasp, "Blue Line" Finish 16.00  
Cant Hooks, Mail Socket Clasp, Common Finish 7 doz. 14.50  
Cant Hooks, Clip Clasp, "Blue Line" Finish 7 doz. 14.00  
Cant Hooks, Clip Clasp, Common Finish 7 doz. 12.00  
Hand Spikes 7 doz. 6 ft., 15.00; 8 ft., 16.00; 10 ft., 17.00; 12 ft., 18.00; 14 ft., 19.00; 16 ft., 20.00; 18 ft., 21.00; 20 ft., 22.00; 22 ft., 23.00; 24 ft., 24.00; 26 ft., 25.00; 28 ft., 26.00; 30 ft., 27.00; 32 ft., 28.00; 34 ft., 29.00; 36 ft., 30.00; 38 ft., 31.00; 40 ft., 32.00; 42 ft., 33.00; 44 ft., 34.00; 46 ft., 35.00; 48 ft., 36.00; 50 ft., 37.00; 52 ft., 38.00; 54 ft., 39.00; 56 ft., 40.00; 58 ft., 41.00; 60 ft., 42.00; 62 ft., 43.00; 64 ft., 44.00; 66 ft., 45.00; 68 ft., 46.00; 70 ft., 47.00; 72 ft., 48.00; 74 ft., 49.00; 76 ft., 50.00; 78 ft., 51.00; 80 ft., 52.00; 82 ft., 53.00; 84 ft., 54.00; 86 ft., 55.00; 88 ft., 56.00; 90 ft., 57.00; 92 ft., 58.00; 94 ft., 59.00; 96 ft., 60.00; 98 ft., 61.00; 100 ft., 62.00; 102 ft., 63.00; 104 ft., 64.00; 106 ft., 65.00; 108 ft., 66.00; 110 ft., 67.00; 112 ft., 68.00; 114 ft., 69.00; 116 ft., 70.00; 118 ft., 71.00; 120 ft., 72.00; 122 ft., 73.00; 124 ft., 74.00; 126 ft., 75.00; 128 ft., 76.00; 130 ft., 77.00; 132 ft., 78.00; 134 ft., 79.00; 136 ft., 80.00; 138 ft., 81.00; 140 ft., 82.00; 142 ft., 83.00; 144 ft., 84.00; 146 ft., 85.00; 148 ft., 86.00; 150 ft., 87.00; 152 ft., 88.00; 154 ft., 89.00; 156 ft., 90.00; 158 ft., 91.00; 160 ft., 92.00; 162 ft., 93.00; 164 ft., 94.00; 166 ft., 95.00; 168 ft., 96.00; 170 ft., 97.00; 172 ft., 98.00; 174 ft., 99.00; 176 ft., 100.00; 178 ft., 101.00; 180 ft., 102.00; 182 ft., 103.00; 184 ft., 104.00; 186 ft., 105.00; 188 ft., 106.00; 190 ft., 107.00; 192 ft., 108.00; 194 ft., 109.00; 196 ft., 110.00; 198 ft., 111.00; 200 ft., 112.00; 202 ft., 113.00; 204 ft., 114.00; 206 ft., 115.00; 208 ft., 116.00; 210 ft., 117.00; 212 ft., 118.00; 214 ft., 119.00; 216 ft., 120.00; 218 ft., 121.00; 220 ft., 122.00; 222 ft., 123.00; 224 ft., 124.00; 226 ft., 125.00; 228 ft., 126.00; 230 ft., 127.00; 232 ft., 128.00; 234 ft., 129.00; 236 ft., 130.00; 238 ft., 131.00; 240 ft., 132.00; 242 ft., 133.00; 244 ft., 134.00; 246 ft., 135.00; 248 ft., 136.00; 250 ft., 137.00; 252 ft., 138.00; 254 ft., 139.00; 256 ft., 140.00; 258 ft., 141.00; 260 ft., 142.00; 262 ft., 143.00; 264 ft., 144.00; 266 ft., 145.00; 268 ft., 146.00; 270 ft., 147.00; 272 ft., 148.00; 274 ft., 149.00; 276 ft., 150.00; 278 ft., 151.00; 280 ft., 152.00; 282 ft., 153.00; 284 ft., 154.00; 286 ft., 155.00; 288 ft., 156.00; 290 ft., 157.00; 292 ft., 158.00; 294 ft., 159.00; 296 ft., 160.00; 298 ft., 161.00; 300 ft., 162.00; 302 ft., 163.00; 304 ft., 164.00; 306 ft., 165.00; 308 ft., 166.00; 310 ft., 167.00; 312 ft., 168.00; 314 ft., 169.00; 316 ft., 170.00; 318 ft., 171.00; 320 ft., 172.00; 322 ft., 173.00; 324 ft., 174.00; 326 ft., 175.00; 328 ft., 176.00; 330 ft., 177.00; 332 ft., 178.00; 334 ft., 179.00; 336 ft., 180.00; 338 ft., 181.00; 340 ft., 182.00; 342 ft., 183.00; 344 ft., 184.00; 346 ft., 185.00; 348 ft., 186.00; 350 ft., 187.00; 352 ft., 188.00; 354 ft., 189.00; 356 ft., 190.00; 358 ft., 191.00; 360 ft., 192.00; 362 ft., 193.00; 364 ft., 194.00; 366 ft., 195.00; 368 ft., 196.00; 370 ft., 197.00; 372 ft., 198.00; 374 ft., 199.00; 376 ft., 200.00; 378 ft., 201.00; 380 ft., 202.00; 382 ft., 203.00; 384 ft., 204.00; 386 ft., 205.00; 388 ft., 206.00; 390 ft., 207.00; 392 ft., 208.00; 394 ft., 209.00; 396 ft., 210.00; 398 ft., 211.00; 400 ft., 212.00; 402 ft., 213.00; 404 ft., 214.00; 406 ft., 215.00; 408 ft., 216.00; 410 ft., 217.00; 412 ft., 218.00; 414 ft., 219.00; 416 ft., 220.00; 418 ft., 221.00; 420 ft., 222.00; 422 ft., 223.00; 424 ft., 224.00; 426 ft., 225.00; 428 ft., 226.00; 430 ft., 227.00; 432 ft., 228.00; 434 ft., 229.00; 436 ft., 230.00; 438 ft., 231.00; 440 ft., 232.00; 442 ft., 233.00; 444 ft., 234.00; 446 ft., 235.00; 448 ft., 236.00; 450 ft., 237.00; 452 ft., 238.00; 454 ft., 239.00; 456 ft., 240.00; 458 ft., 241.00; 460 ft., 242.00; 462 ft., 243.00; 464 ft., 244.00; 466 ft., 245.00; 468 ft., 246.00; 470 ft., 247.00; 472 ft., 248.00; 474 ft., 249.00; 476 ft., 250.00; 478 ft., 251.00; 480 ft., 252.00; 482 ft., 253.00; 484 ft., 254.00; 486 ft., 255.00; 488 ft., 256.00; 490 ft., 257.00; 492 ft., 258.00; 494 ft., 259.00; 496 ft., 260.00; 498 ft., 261.00; 500 ft., 262.00; 502 ft., 263.00; 504 ft., 264.00; 506 ft., 265.00; 508 ft., 266.00; 510 ft., 267.00; 512 ft., 268.00; 514 ft., 269.00; 516 ft., 270.00; 518 ft., 271.00; 520 ft., 272.00; 522 ft., 273.00; 524 ft., 274.00; 526 ft., 275.00; 528 ft., 276.00; 530 ft., 277.00; 532 ft., 278.00; 534 ft., 279.00; 536 ft., 280.00; 538 ft., 281.00; 540 ft., 282.00; 542 ft., 283.00; 544 ft., 284.00; 546 ft., 285.00; 548 ft., 286.00; 550 ft., 287.00; 552 ft., 288.00; 554 ft., 289.00; 556 ft., 290.00; 558 ft., 291.00; 560 ft., 292.00; 562 ft., 293.00; 564 ft., 294.00; 566 ft., 295.00; 568 ft., 296.00; 570 ft., 297.00; 572 ft., 298.00; 574 ft., 299.00; 576 ft., 300.00; 578 ft., 301.00; 580 ft., 302.00; 582 ft., 303.00; 584 ft., 304.00; 586 ft., 305.00; 588 ft., 306.00; 590 ft., 307.00; 592 ft., 308.00; 594 ft., 309.00; 596 ft., 310.00; 598 ft., 311.00; 600 ft., 312.00; 602 ft., 313.00; 604 ft., 314.00; 606 ft., 315.00; 608 ft., 316.00; 610 ft., 317.00; 612 ft., 318.00; 614 ft., 319.00; 616 ft., 320.00; 618 ft., 321.00; 620 ft., 322.00; 622 ft., 323.00; 624 ft., 324.00; 626 ft., 325.00; 628 ft., 326.00; 630 ft., 327.00; 632 ft., 328.00; 634 ft., 329.00; 636 ft., 330.00; 638 ft., 331.00; 640 ft., 332.00; 642 ft., 333.00; 644 ft., 334.00; 646 ft., 335.00; 648 ft., 336.00; 650 ft., 337.00; 652 ft., 338.00; 654 ft., 339.00; 656 ft., 340.00; 658 ft., 341.00; 660 ft., 342.00; 662 ft., 343.00; 664 ft., 344.00; 666 ft., 345.00; 668 ft., 346.00; 670 ft., 347.00; 672 ft., 348.00; 674 ft., 349.00; 676 ft., 350.00; 678 ft., 351.00; 680 ft., 352.00; 682 ft., 353.00; 684 ft., 354.00; 686 ft., 355.00; 688 ft., 356.00; 690 ft., 357.00; 692 ft., 358.00; 694 ft., 359.00; 696 ft., 360.00; 698 ft., 361.00; 700 ft., 362.00; 702 ft., 363.00; 704 ft., 364.00; 706 ft., 365.00; 708 ft., 366.00; 710 ft., 367.00; 712 ft., 368.00; 714 ft., 369.00; 716 ft., 370.00; 718 ft., 371.00; 720 ft., 372.00; 722 ft., 373.00; 724 ft., 374.00; 726 ft., 375.00; 728 ft., 376.00; 730 ft., 377.00; 732 ft., 378.00; 734 ft., 379.00; 736 ft., 380.00; 738 ft., 381.00; 740 ft., 382.00; 742 ft., 383.00; 744 ft., 384.00; 746 ft., 385.00; 748 ft., 386.00; 750 ft., 387.00; 752 ft., 388.00; 754 ft., 389.00; 756 ft., 390.00; 758 ft., 391.00; 760 ft., 392.00; 762 ft., 393.00; 764 ft., 394.00; 766 ft., 395.00; 768 ft., 396.00; 770 ft., 397.00; 772 ft., 398.00; 774 ft., 399.00; 776 ft., 400.00; 778 ft., 401.00; 780 ft., 402.00; 782 ft., 403.00; 784 ft., 404.00; 786 ft., 405.00; 788 ft., 406.00; 790 ft., 407.00; 792 ft., 408.00; 794 ft., 409.00; 796 ft., 410.00; 798 ft., 411.00; 800 ft., 412.00; 802 ft., 413.00; 804 ft., 414.00; 806 ft., 415.00; 808 ft., 416.00; 810 ft., 417.00; 812 ft., 418.00; 814 ft., 419.00; 816 ft., 420.00; 818 ft., 421.00; 820 ft., 422.00; 822 ft., 423.00; 824 ft., 424.00; 826 ft., 425.00; 828 ft., 426.00; 830 ft., 427.00; 832 ft., 428.00; 834 ft., 429.00; 836 ft., 430.00; 838 ft., 431.00; 840 ft., 432.00; 842 ft., 433.00; 844 ft., 434.00; 846 ft., 435.00; 848 ft., 436.00; 850 ft., 437.00; 852 ft., 438.00; 854 ft., 439.00; 856 ft., 440.00; 858 ft., 441.00; 860 ft., 442.00; 862 ft., 443.00; 864 ft., 444.00; 866 ft., 445.00; 868 ft., 446.00; 870 ft., 447.00; 872 ft., 448.00; 874 ft., 449.00; 876 ft., 450.00; 878 ft., 451.00; 880 ft., 452.00; 882 ft., 453.00; 884 ft., 454.00; 886 ft., 455.00; 888 ft., 456.00; 890 ft., 457.00; 892 ft., 458.00; 894 ft., 459.00; 896 ft., 460.00; 898 ft., 461.00; 900 ft., 462.00; 902 ft., 463.00; 904 ft., 464.00; 906 ft., 465.00; 908 ft., 466.00; 910 ft., 467.00; 912 ft., 468.00; 914 ft., 469.00; 916 ft., 470.00; 918 ft., 471.00; 920 ft., 472.00; 922 ft., 473.00; 924 ft., 474.00; 926 ft., 475.00; 928 ft., 476.00; 930 ft., 477.00; 932 ft., 478.00; 934 ft., 479.00; 936 ft., 480.00; 938 ft., 481.00; 940 ft., 482.00; 942 ft., 483.00; 944 ft., 484.00; 946 ft., 485.00; 948 ft., 486.00; 950 ft



Acme, Nickeled.....	40@40¢5¢
Athena's Pocket (Flight)	\$2.50@2.50

Alken's Pocket (Bright).....	\$2.50@12.50
Alligator.....	60@60&10
Always Ready.....	33 1/2@10@40&5

Combination  
Combination

Cylinder or Gas Pipe.....	45¢
Extra Heavy.....	45¢
Merrick's Pattern.....	45¢
No. 3 Pipe Bright.....	50¢

Bit Wrench, Ad.

Boardman's	30@30=55
Cincinnati Brace Wrenches	25@11=
Diamond Steel	55@10=
Donohue's Engineer	20@10=
Eagle	50@10=
Hercules	70@70=107
Taft's Vice Wrench	55@10=4
Tatum's Brace	25@10=
The Favorite Rocket * dos 4	20@40=55
Walker's	55@38
Webster's Pat. Combination	25@

Colby Wringer  
Lovell Mfg. Co.,

Peerless Mfg. Co., list Feb., 1892... 2% cash  
National Wringer & Mfg. Co., list  
June 1, 1892... 8% cash

**Wrought**

Staples, Hooks, &c., list, March 17, 1862  
855-260904

Zinc, Frech, Green Seal.....	8 1/2 @	19
Zinc, Frech, V. M. X.....	.. @	7
Zinc, Antwerp, Red Seal....	6 @	6 1/2

Zinc, Antwerp, Green Seal.....	6 7/8 @	7 1/2
Zinc, German, L. Z. O.....	5 @	5
Zinc, V. M. in Poppy Oil, G.		
over, lots of 1 ton and	10 1/4 @	11
lots less than one ton.....	11 @	11
Zinc, V. M. in Poppy Oil,		
Red Seal.....	5 @	5
lots of 1 ton and over.....	10 1/4 @	11
lots of less than 1 ton.....	11 @	11
Overcoats, French Zinc.....	10 1/4 @	11
buyers of 10 bbl. lots of one or assorted		
grades, 1 1/2; 25 bbls., 2 1/2; 60 bbls., 4 1/2.		
No discount allowed on less than bbl. lots.		

### Colors In Oil—

Black, Drop, Frankfurt.....	25 @	30
Black, Drop, English.....	12 @	15
Black, Drop, Domestic.....	7 @	10
Black, Lamplack, Best.....	20 @	35
Black, Lamplack, Common.....	7 @	13
Black, Ivory.....	8 @	15
Blue, Chinese.....	35 @	40
Blue, Prussian.....	20 @	45
Blue, Ultramarine.....	12 @	18
Brown, Bland.....	7 @	13
Green, Chrome.....	7 @	13
Green, Paris.....	16 @	18 1/2
Sienna, Raw.....	7 @	14
Sienna, Burnt.....	7 @	14
Umber, Raw.....	7 @	10
Umber, Burnt.....	7 @	10

### Putty—

In barrels and 1/2 bbls.....	.01 1/2 @	.01 1/2
In tubs.....	.01 1/2 @	.01 1/2
In tin cans.....	.01 1/2 @	.02 1/2
In bladders.....	.01 1/2 @	.03 1/2

### Spirits Turpentine—

In regular bbls.....	28 1/4 @	28 1/4
In machine bbls.....	29 @	29 1/4

### Glue—

Low Grade.....  
Cabinet

Cabinet.....	11	@	12
Medium White.....	12	@	14
Extra White.....	16	@	20
French.....	10	@	23
English.....	10	@	15
Irish.....	10	@	12

# AGE.

*Metal Trades, and a*  
*y.*

**TAGE.**

**COUNTRIES.**

5 francs=20 marks=  
100 pesetas

$$\begin{aligned} 10/ &= 12\frac{1}{2} \text{ francs} = 10 \\ &= 12\frac{1}{2} \text{ lire} = 10 \text{ pesetas} \end{aligned}$$

4 francs=5 marks=  
1 lire=5 pesetas.

ONE INCH)

- - - - \$30.00  
- - - - 50.00  
Fees quoted on application

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